Electronic payments in DoD contracting

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by

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Electronic payment methods are rapidly changing the way in which invoices are paid, displacing the traditional paper check method. Electronic payments can provide a secure, rapid, accurate, and cost effective means for issuing and receiving payment, if properly implemented. This study provides an assessment as to whether or not the expanded use of electronic payments for DoD contracts is improving the payment process. Three DoD contract paying activities which have implemented electronic payment systems are examined: DFAS-Columbus Center (MOCAS system), Aviation Supply Office, Philadelphia (IDA system), and DFAS-Cleveland (STARS/SEPS system). An analysis of these systems, their objectives, and the difficulties associated with DoD payment/accounting processes is presented. A survey of defense contractors provides an assessment of electronic payment usage in private industry, as well as an evaluation of DoD's electronic payment capabilities from a "customer" perspective.

Several suggestions which may help make DoD electronic payment capabilities more effective will be offered.

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Electronic Payments in DoD Contracting

by

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ABSTRACT

Electronic payment methods are rapidly changing the way in which invoices are paid, displacing the traditional paper check method. Electronic payments can provide a secure, rapid, accurate, and cost effective means for issuing and receiving payment, if properly implemented. This study provides an assessment as to whether or not the expanded use of electronic payments for DoD contracts is improving the contract payment process.

Three DoD contract paying activities which have implemented electronic payment systems are examined: DFAS-Columbus Center (MOCAS system), Aviation Supply Office, Philadelphia (IDA system), and DFAS-Cleveland (STARS/SEPS system). An analysis of these systems, their objectives, and the difficulties associated with DoD payment/accounting processes is presented. A survey of defense contractors provides an assessment of electronic payment usage in private industry, as well as an evaluation of DoD's electronic payment capabilities from a "customer" perspective.

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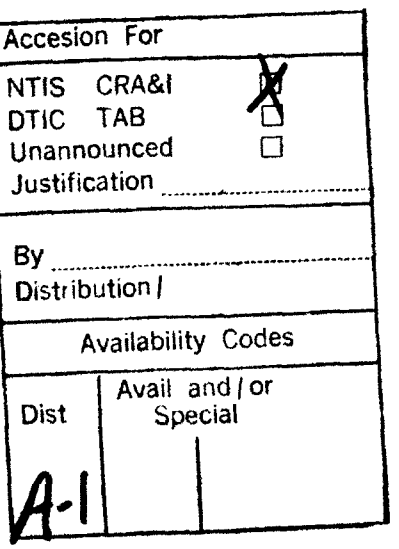

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Finally, special thanks need to go to Ms. Sigrid Marmann of the Northern California EDI Users Group. Ms. Marmann provided an excellent sounding board for electronic payment issues, and identified the "pulse points" that private industry looks at with regard to electronic payments.

I. INTRODUCTION

To a business activity, one of the most important transactions that takes place between it and its customer is getting paid the correct amount, on time. For defense contractors, the importance of getting paid by the Government on time is no less important. For many small businesses which contract with the Department of Defense (DoD), receiving payment on time can become a necessity for survival. DoD pays its contractors in various ways. Defense contractors have traditionally been sent check payment by mail or deposit in a lockbox. Today, DoD is replacing these manual procedures at a rapid pace. It is the purpose of this study to explore the way in which DoD is expanding the use of electronic means to pay its contractors. First, an overview of the DoD contract payment structure and DoD projects for implementing electronic payment mechanisms is made. Then, an assessment of whether electronic payments are achieving their intended result will be made.

A. BACKGROUND AND OBJECTIVES.

This study will first focus on those key organizations, systems, and procedures which play a role in the contractor payment process. Each activity in the process will be examined both individually and as part of the overall payment process. Then, those electronic payment methods which are now being used or are under development will be reviewed, and an evaluation made as to their effectiveness. This study can be broken

down into several key subject areas. The following is a brief synopsis of the areas examined.

1. Electronic Funds Transfer.

When one speaks of paying electronically, the term Electronic Funds Transfer (EFT) often comes up. Whether we are aware of it or not, EFT has become an integral part of most of our lives. Applications which require EFT include bank debit cards, home computer networking services which permit electronic bill payment (such as Prodigy and Compuserve), and the direct deposit of payroll checks. Because of the number of widespread applications which rely on EFT, it is frequently misunderstood as to what it actually encompasses. EFT specifically refers to "bank to bank electronic payment instructions...."·[Ref. 1: p. 11]. Yet, it is often associated with the electronic transmission of any payment information between various trading partners.

The distinction between EFT and Electronic Data Interchange (EDI) is often confused. EDI can be defined as the "{computer} application to {computer} application transmission of business data in a standard format".[Ref. 2: p. 65] This study will explain what the EDI standards are, and the role of the American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X.12. ANSI establishes EDI standard formats for most business transactions. The relationship between EFT and EDI will be examined. While EDI and EFT offer their own unique capabilities, they do, at times, overlap. One area of EDI, referred to as "financial EDI", deals specifically with electronic

payment functions. What constitutes financial EDI will be examined as well.

2. DoD's Electronic Commerce Program.

DoD is actively pursuing the integration of its business processes through electronic means in what it has dubbed its "Electronic Commerce" (EC) program. [Ref. 3: p. 1-1] The Defense Logistics Agency (DLA) has been designated as the responsible entity for implementing the EC program, and has established an EDI/EC Executive Agent office to oversee EDI/electronic payment projects and ensure compliance with DoD-wide EDI standards. [Ref. 4: para. 1.3] The role of the DLA Executive Agent office will be examined, as well as how electronic payment projects tie into the overall EC program.

3. The Contract Accounting/Payment Cycle.

The way in which DoD pays its contractors is a complex, multi-step process involving numerous activities. It is important to understand the process before trying to understand what the implications of automating the process electronically will be. Therefore the steps involved in paying contractors will be reviewed briefly, with a schematic of the accounting/payment "cycle" provided.

4. The Federal Reserve Banking System.

Any payment system would be incomplete without a banking infrastructure. Since DoD pays its contractors from its accounts at several Federal Reserve banks, it is important to understand how the Federal Reserve System (FRS) is structured. The FRS and its member banks have used electronic payments for many years and have a well

structured, reliable network. An overview of the Federal Reserve banking system, its funds transfer mechanisms, with particular focus on the Automated Clearing House (ACH) network, will be provided.

5. The Role of Defense Finance and Accounting Service (DFAS)-Columbus Center in Contract Payments.

The fifth subject area examined is the DFAS-Columbus Center. It is an active participant in DoD electronic payment initiatives, responsible for DoD contract payments. This study will discuss the role of DFAS-Columbus Center by focusing on the following subject areas.

a. Consolidation of DoD Accounting and Finance Operations.

One of the key decisions which is changing the way DoD pays its contractors is Defense Management Review Decision (DMRD) 910, "Consolidation of DoD Accounting and Finance Operations" which went into effect 1 October 1992. [Ref. 5: p. 5] One result of DMRD 910 was the designation of DFAS-Columbus Center as the contract payment "hub" for DoD. DFAS-Columbus not only becomes an important site for integrating many of the Electronic Commerce EDI/EFT initiatives, but also it must merge the existing DoD contract payment systems into its own system.

b. Mechanization of Contract Administrative Services (MOCAS).

DFAS-Columbus Center presently uses the Mechanization of Contract Administration Services (MOCAS) for its contract payment functions. While the electronic payment function at DFAS-Columbus has been an established program for some time, the expansion of MOCAS's responsibility and the integration of the other DoD services' systems

presents some considerable challenges for Columbus. The challenges include:

- The technical aspects of integrating unique computer systems using EDI transaction sets (ANSI ASC X.12 approved).
- A rapid expansion of contract, invoice, and disbursement workload.
- Common concerns in dealing with EDI transactions, such as security, legal issues, trading partner agreements, etc.

c. Merger of the Acquisition Management Information System (AMIS), U.S. Air Force.

One contract payment system merger with MOCAS is the Air Force's Acquisition Management Information System (AMIS). The merger of the AMIS payment function with MOCAS is in progress. The success of this system merger can have implications for the integration of other systems and can affect the success of DFAS-Columbus as the central contract payment site. The issues associated with the subject areas outlined here, as well as an extensive look at the DFAS-Columbus Center payment processes will be discussed.

6. A Buying Office's Perspective of Contract Payments.

The impact of electronic payment functions affects not only the DoD payment office, but also other DoD activities which must rely upon accurate, timely payments to support their missions. One such activity is the DoD buying office, which not only awards the contract, but may also manage contract expenditures.

a. Aviation Supply Office, Philadelphia.

One buying activity which is being relieved of its contract payment responsibilities is the Aviation Supply Office, Philadelphia (ASO). A Navy inventory control point (ICP) and buying office, it is a recognized leader for the Navy in DoD's Electronic Commerce program. ASO Philadelphia is also designated as an Authorization Accounting Activity (AAA) because of its procurement responsibilities. As an AAA, ASO Philadelphia is responsible for matching expenditures (actual payments) to those appropriated funds it is obliged to spend (obligations). There can be difficulties associated with matching expenditures to obligations as payment data flow through the accounting/payment cycle. The problems associated with matching expenditures to the proper appropriation will be discussed in the study.

b. The Role of the Authorization Accounting Activity (AAA).

The consolidation of contract payments under DFAS-Columbus Center changes the role of ASO Philadelphia in the accounting/payment cycle. ASO, in a sense, is becoming a "customer" of the accounting/payment system (i.e., it must rely upon DFAS for payment services), as opposed to a service provider (paying activity). An examination of the changes that are taking place at ASO internally as a result of the contract payments consolidation and the issues raised by ASO from a buying office/AAA perspective will be examined.

7. Electronic Payments From a Contractors' Perspective.

With DoD taking an aggressive role in the implementation of EDI and electronic payments through its EC program, the role of the

contractor as an electronic "trading partner" becomes critical to the success of the program. How does the contractor feel about receiving payments electronically? A survey of contractors was conducted focusing on three areas:

- An overview of EDI/electronic payment use by contractors.
- An evaluation of DFAS-Columbus Center and its contract payment capabilities.
- An evaluation of banking support for EDI/electronic payment initiatives.

The areas described above all provide a unique perspective on DoD electronic payment capabilities. As this study has discovered, the contract payment process is tightly intertwined with DoD's accounting systems and processes, thereby influencing electronic payment capabilities.

B. RESEARCH QUESTIONS.

To provide a structured approach for this study, the following research questions will be investigated.

1. Primary Research Question:

As one element of the DoD Electronic Commerce Program, how will the expanded use of electronic payments improve contract payment capabilities?

2. Subsidiary Research Questions:

a. What are the principal elements of electronic payments?

b. What Federal Government, DoD, or industry standards have been established for electronic payments?

c. What is the relationship between EFT and EDI, and to what extent do the two processes complement each other?

d. What are the current EDI and EFT contract payment initiatives underway, and to what extent are they achieving their intended result?

e. What are the current problems/hurdles which must be overcome to achieve electronic payment program objectives?

f. What is industry's general perspective with regard to electronic payments?

g. How might electronic payment capabilities best be used at field activities, such as Aviation Supply Office, Philadelphia (U.S. Navy)?

C. SCOPE, LIMITATIONS, ASSUMPTIONS.

This study will limit itself to DoD contract payments. Small purchases and revolving stock fund (non-appropriated) payments will not be directly discussed. Some of the issues being covered are quite complex, (e.g., the technical aspects of EDI and computer system functions both within DoD and the Federal Reserve Bank System). However, only an overview discussion of such issues will be provided for the reader. Flow charts will be used to a great extent to help simplify complex issues. Where a more detailed explanation is necessary, it will be provided as an appendix.

The intent of this study is to better understand how contract payments tie together the various activities involved, the impact of electronic payment and EDI initiatives, and what the consolidation of contract payments under DFAS-Columbus Center will entail. The key

issues and problems identified by the author which impact the accounting/payment cycle will be addressed.

One limiting aspect of this study is the fact that many of the initiatives underway are in implementation stages, thus a detailed evaluation of their performance would be premature. For those initiatives under development, an examination of the issues and difficulties currently being experienced will be provided.

D. RESEARCH METHODOLOGY.

In addition to a thorough analysis of available literature, three primary research methods were used to support this study. Personal interviews were conducted with key personnel at DFAS-Columbus Center, ASO Philadelphia, DLA-EDI/EC Executive Agent Office, and DFAS-Washington D.C. Telephone interviews also supported much of this study. The second research method was the defense contractor survey described earlier. Five hundred contractors, all paid by DFAS-Columbus Center and identified as electronic payment users, were mailed surveys; 151 contractors (30%) responded to the survey, providing valuable information on electronic payments from a contractor's perspective.

Personal observations of the accounting/payment processes at both DFAS-Columbus Center and ASO Philadelphia comprise the third method of data collection. These trips were funded by the Defense Logistics Agency (DLA) EDI Executive Agent Office. The author spent several days at each site to "walk through" the accounting/payment processes

and discuss the issues/concerns of those involved in the process. These trips were invaluable to this research. The observations made helped clarify the interrelationship between activities in the accounting/payment cycle.

E. PRELIMINARY SUMMARY OF FINDINGS.

Electronic payments can provide a secure, cost effective method of payment, while greatly enhancing the speed with which payment information flows between the paying activity and the recipient. However, based upon the data collected for this study, electronic payments provide only a marginal improvement in DoD's contract payment capabilities. Within DoD there are two significant factors that undermine the electronic payment process. (1) the efficiency and accuracy with which invoices are processed before payment and (2) the adequacy of the electronic payment information the defense contractors receive from their banks. As this study will reveal, there are several identifiable causes for these deficiencies that can diminish DoD electronic payment capabilities.

F. LIST OF ABBREVIATIONS.

Because of the broad range in terminology associated with electronic payments, electronic data interchange, the Department of Defense, and the banking industry, a list of abbreviations is provided in Appendix A.

G. ORGANIZATION OF STUDY.

The early chapters of this study will build a foundation for the understanding of EDI/electronic payments, the DoD accounting/payment cycle for contract payments, and the Federal Reserve System. Once this foundation has been built, the author will show how these topics interrelate, present survey/interview results, and evaluate the use of EDI/electronic payment capabilities in contract payments. The remaining chapters of this study are as follows:

Chapter II provides the foundation for the study of DoD electronic payments, and is divided into four topics. In part B, an overview of the Federal Reserve System and its electronic payment infrastructure will be given. In part C, EFT, EDI, and Financial EDI structures, processes, and regulatory controls will be examined. In part D, DoD's payment/accounting "cycle" will be outlined. In part E, current DoD electronic payment and EDI initiatives will be discussed.

Because of the level of discussion necessary to adequately describe each of these four topics, Chapter II is an in depth discussion. Some readers familiar with the topics may wish to skim over this chapter.

Chapter III provides a brief summary of the literature review and the three methods of research used in this study: telephone and personal interviews, a defense contractor survey on electronic payments, and observations made during research visits. Chapter IV will discuss the issues associated with electronic payments and the impact that the consolidation of DoD contract payment functions under DFAS is having.

Results from the defense contractor survey will be provided. Chapter V will analyze the data collected to provide an overall assessment of DoD electronic payment capabilities for contracts as they exist today. Chapter VI will provide a summary of the study and provide answers to the research questions outlined in part B of this chapter. Recommendations will be offered for possible improvement to DoD's electronic payment processes. Finally, several topics for future research will be suggested.

II. BACKGROUND

A. INTRODUCTION.

This chapter will provide the reader with an understanding of what electronic payments are and how they are incorporated into DoD's contract payment processes. The following are four general topic areas that will help provide this foundation, (1) a review of the Federal Reserve's electronic payment systems, (2) an overview of electronic payment applications, (3) the DoD contract payment/accounting cycle, and (4) current electronic payment and EDI initiatives within DoD.

B. THE FEDERAL RESERVE SYSTEM (FRS).

1. Historical Overview of the FRS.

It seems appropriate to begin a review of electronic payments capabilities with the FRS, since it was an early leader in the development of electronic payments. The FRS was created as a result of the Federal Reserve Act of 1913. Its purpose is to provide "...fiscal agency and depository services to the Department of the Treasury." [Ref. 7: p. 727] The Federal Reserve Bank became the Treasury's depository, acting as the Treasury's agent for collecting and disbursing funds. With the growth in the use of checks as a payment mechanism throughout this century, the FRS, in cooperation with commercial banking, became the network by which checks are cleared [Ref. 6: p. 13].

In the process,

> ...The commercial banks prepare and presort the checks for entry into the system and the Federal Reserve maintains the arterial flow of checks between and within its districts. [Ref. 6: p. 13]

Two major events in the bank check clearing process fostered the development of electronic payments. First, banks were among the initial users of computers, which were originally used for bookkeeping, accounting, and check sorting tasks [Ref 8: p. 21]. By the early 1960's the volume of checks exceeded 12 billion, and concerns were raised that the check processing system would not be able to handle the rapid growth [Ref 6: p. 15]. The second major event was the introduction of magnetic ink character recognition (MICR), which permitted electronic scanning and, thus, rapid, efficient processing of checks [Ref 8: p. 21]. This helped save the check clearing process from collapse.

2. The Advent of Automated Clearing Houses.

The concept of substituting electronic payment information for paper check transactions began to evolve by the late 1960's:

> The need to improve the nation's payments system was recognized as imperative in the late 1960's. Special task forces began to develop a workable alternative to paper checks before the volume became overwhelming. A direct result of the early groundwork was the establishment of the first automated clearing house (ACH) for the exchange of paperless entries, the Calwestern Automated Clearing House Association (CACHA), in 1972. [Ref. 9: p. OG-1]

The Federal Reserve Bank was active in the evolution of ACH's from the start, working with the newly formed ACH organizations, providing technical support and the data processing capability with which most of

the ACH's operated. [Ref. 9: p. OG-1] The National Automated Clearing House Association (NACHA) was formed in 1974 to coordinate the expansion of the ACH network nationwide [Ref. 9: p. OG-1].

3. The National Commission on Electronic Funds Transfer.

In October 1974 the National Commission on Electronic Funds Transfer was created by Congress because of concerns that the rapid growth of EFT without legislative oversight might "...result in distortions to competition and the invasion of individual citizens' right to privacy and confidentiality." [Ref. 10: p. 3] Issues of competition in financial institutions, consumer protection and confidentiality, and economic and monetary policy were among the issues to be reviewed [Ref. 10: pp. 3-4].

The Commission's final report makes numerous recommendations, along with the following general conclusion:

> ...EFT should be allowed to develop free from unnecessary regulation and to remain as open as possible to marketplace pressures and consumer demands. In this way, innovation will be sparked, the largest possible array of alternative EFT services and systems will be placed before users and consumers, and the unfettered choice among these alternatives will produce an EFT environment that is most responsive to the public's needs and desires. [Ref. 10: p. 4]

Regarding the role of the Federal Reserve in the ACH process, the Commission recommended

> ...that it is appropriate for the Federal Reserve to continue to provide the basic level of ACH-type services necessary to clear and settle batched electronic payments between depository institutions locally, regionally, and interregionally. The Commission also recommends that the Federal Reserve not discriminate against the private sector development, establishment, and operation of alternatives to Federal Reserve ACH facilities. [Ref. 10: p. 214]

The development of EFT and the electronic payment infrastructure since the Commission's recommendations will now be discussed.

4. The Federal Reserve System Today.

The Federal Reserve System has been likened to a financial service "wholesaler", servicing the commercial bank industry, whereas the commercial banks are the "retailers", offering the more localized services necessary for the private sector [Ref. 11: p. 234]. The FRS has 12 regions, with a central bank for each region. There are 25 branch banks within the 12 regions, which support the regional bank. The Federal Reserve Board of Governors resides in Washington D.C. The 12 regional banks are Board members. The Board of Governors provides monetary and fiscal policy, as well as operational control over the FRS structure. Figure 1 provides a geographical display of the FRS banking system. The role of the Federal Reserve in electronic payment systems can best be described in its general policy statement:

> The Federal Reserve has a wide-ranging participatory role in the payments system. The Federal Reserve assisted in developing the automated clearinghouse (ACH) system for small-dollar electronic payments and now provides a nationwide electronic ACH network. Depository institutions transfer large dollar payments over the Federal Reserve's nationwide wire transfer system (Fedwire). [Ref. 12: p. 293]

The Fed sees its role as going beyond the functional aspects of banking and financial services, as the following passages from their policy

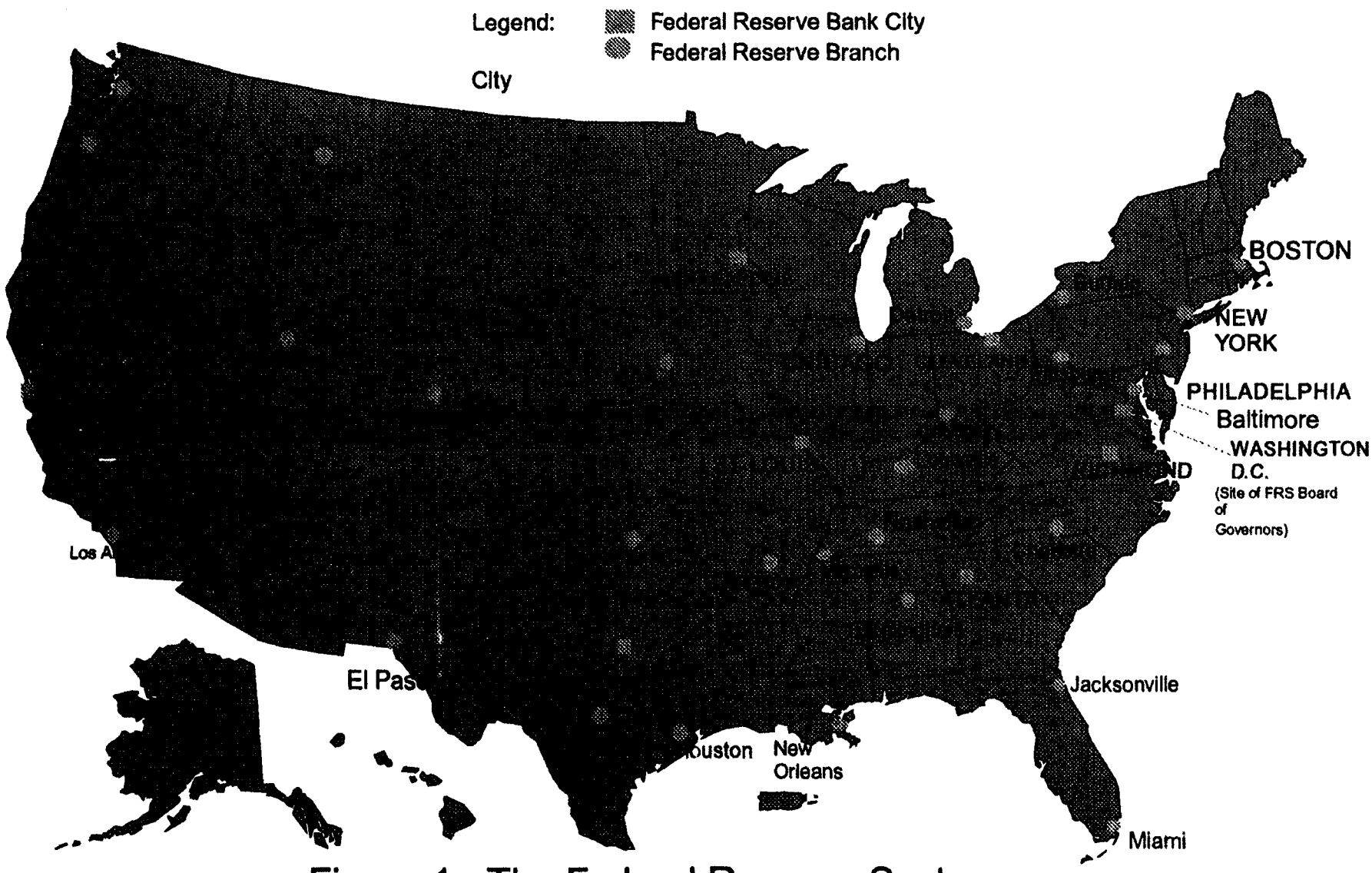


Figure 1: The Federal Reserve System

[Source: Board of Governors of the Federal Reserve System, Federal Reserve Bulletin, v. 78 no. 10, pp. A80-81, October 1992.

statement address:

> The Federal Reserve's direct and ongoing participation in the operation of the payments system enhances the integrity of the payment process.
>
> Federal Reserve involvement in the payments system promotes efficiency for a variety of reasons. The Federal Reserve has a public interest motivation in seeking to stimulate improvements in the efficiency of the payments system. The Federal Reserve has worked closely with other providers of payment services to develop and use advanced tecnnology and procedures. Because of its day-to-day operating presence in the payments system, it has the know-how to contribute to technical advances as well as the ability to help promote their implementation.
>
> ...Federal Reserve involvement as a neutral and trusted intermediary can facilitate acceptance of innovations that improve the efficiency of the payments system. [Ref. 12: p. 294]

As these statements suggest, the dynamic nature of the U.S. payments system requires a central body to oversee its operation and ensure its credibility.

The Fed, by being in the unique position of providing financial services as well as being the regulator of those services, has drawn some criticism that it cannot perform both functions impartially. Critics have argued that tnere is a

> ...conflict between pursuing the safety and efficiency goals wherever they may lead, on the one hand, and protecting the Fed's own operations in the Reserve banks from competitive pressures, on the other. [Ref. 11: p. 227]

While the issue of dual role as service provider and regulator and the impact that competition plays in the FRS will be briefly discussed, the arguments (pro or con) are beyond the scope of this study. An

understanding of the electronic payment services provided by the FRS will be the primary focus.

5. Operations at the Federal Reserve Today.

The payment services provided by the Fed for the U.S. Treasury can be broadly classified into two categories, depository services and fiscal agency services. Fiscal agency services can be thought of most notably as the securities and bond selling arm of the Fed for the U.S. Treasury [Ref. 7: p. 728]. Depository services, which encompasses electronic payments, fall under the control of the Financial Management Service (FMS) [Ref 7: p. 728].

a. Depository Services.

It is the depository services which will be the focus of the remainder of the discussion on the Federal Reserve. Depository services includes "check processing, funds transfers, and automated clearing house (ACH) payments." [Ref 7: p. 728] Depository services also include tax collection and cash management functions for the Treasury. Depository services are summarized as follows:

> As depositories of the United States, the Federal Reserve Banks maintain Treasury's checking account, clear checks drawn on the account, accept deposits of federal taxes and fees, and make electronic payments on behalf of the Treasury. In all these matters, the Reserve Banks serve Treasury's Financial Management Service, whose responsibilities include the government's systems for collections and payments, central accounting and reporting,and cash management. [Ref. 7: p. 728]

b. Financial Management Service (FMS).

The Financial Management Service (FMS) acts as the financial and accounting managerial arm to the U.S. Treasury. The FMS

> ...oversees the Government's central accounting and reporting system, keeping track of its monetary assets and liabilities. [Ref. 13: p. 3-4]

The FMS acts as the cash manager for the Government, managing a daily cash flow in excess of $10 billion. It manages many of the financial services offered by the Government agencies, disburses 85 percent of all Federal payments through its payment systems, and reconciles all Government payments [Ref. 13: p. 4] from its seven Regional Finance Centers. It is the FMS to which DoD reports its disbursements.

6. The Federal Reserve's Role as Regulator.

As previously discussed, the Federal Reserve has oversight responsibilities for the U.S. banking system. Among the requirements for U.S. banks are to maintain a reserve account with the Federal Reserve. This reserve is a percentage of the banks' total assets, as set by the FRS Board of Governors, and "all Fed member depository institutions must maintain a positive balance in their reserve accounts at the 'close of the business day.'" [Ref. 14: p. 20] Bank examinations fall under the regulatory arm of the Fed, as described below:

> The Federal Reserve System has the dual responsibility of providing electronic funds transfer services through *FEDWIRE* (and other means) and regulating and examining funds transfers and other activities of Federal Reserve banks, branch offices, and member depository financial institutions. Oversight of FEDWIRE (and other electronic payment means) is conducted by the Federal Reserve primarily through annual financial examinations and operations reviews of a bank's activities at least once every 3 years.

> The Federal Reserve Board, Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency have specific regulatory and oversight responsibilities over U.S. banks. These banking agencies point to section 7(c) of the Bank Service Corporation Act, as amended, 12 U.S.C. section 1867(c), as the primary basis for them to regulate and examine the performance of certain traditional banking services.... [Ref. 15: p. 9]

While the banking industry may challenge or disagree with the regulatory requirements of the FRS, the stability and credibility which the FRS adds to the payment system are difficult to challenge. As one author states, the role of the Federal Reserve to the payments system is vital for the following reasons:

- The Fed's maintenance of reserve accounts, which provides the basis for payment system settlement.
- The Fed's nationwide presence, which is unavailable to the private sector because of current regulatory restrictions on geographical presence.
- The Fed's economies of scale that make the centralized provision of fixed cost functions, such as check transportation or data communications, more cost efficient.
- The perception among many banks that the Fed, more than a private-sector supplier would, operate fairly and equitably and is a "trusted intermediary." [Ref. 11: p. 233]

7. The Monetary Control Act of 1980.

The Monetary Control Act of 1980 was passed with two purposes in mind, (1) to recoup Federal Reserve operating expenses through a fee-for-service requirement and (2) to permit open competition with the private sector for financial payment services [Ref. 16: p. 86]. The fee-for-service approach is based upon cost accounting principles, controlled by the Fed's Planning and Control [cost accounting] System (PACS). By charging fees, the intent of the Monetary Control Act was

also to encourage the private sector to offer competing payment structures, in the same way that Federal Express, Emery, and DHL offer package delivery competition for the U.S. Postal Service. Critics have charged that the offer of competition with the FRS was merely a ruse to increase revenues, as the following passage reveals:

> It is important to note, however, that Congress did not mention private competition explicitly in the 1980 Act. The Fed, consequently, does not have a clear, legislative mandate to encourage or foster private competition in payment services. It is thus possible to suggest a different interpretation - that perhaps Congress was mostly concerned with cutting the public subsidy of payment services and leveling the playing field between Fed member institutions and non-members, and that perhaps it did not care so much about private competition. [Ref. 11: p. 224]

The 1980 Act has led to private sector expansion of payment systems, which will be examined later in this section. The specific systems which perform the electronic payment functions will be discussed next.

8. Federal Reserve System Electronic Payment Systems.

There are four electronic payment systems which will be reviewed here, (1) Fedwire (operated by the FRS), (2) Clearing House Interbank Payments System (CHIPS), a private domestic system, (3) the Society for Worldwide Interbank Financial Communications (SWIFT), an international electronic mail payment system, and (4) the Automated Clearing House (ACH), a multi-party network overseen by the FRS. The ACH system will be the primary focus of this study.

a. FEDWIRE.

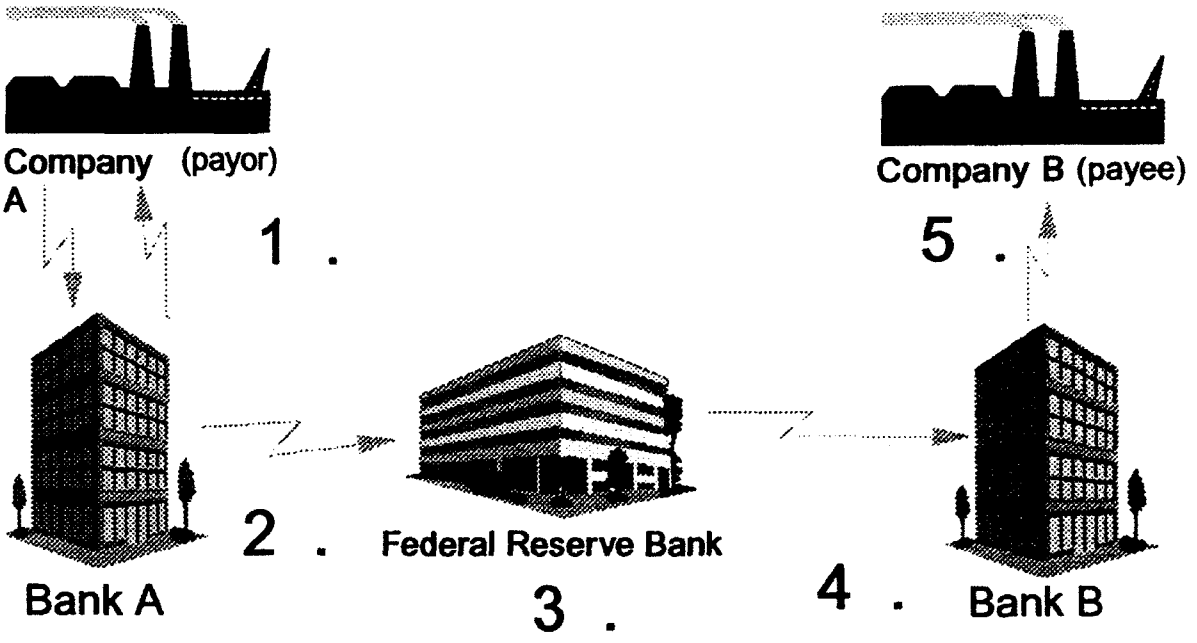
FEDWIRE is the primary means that the Federal Reserve Banks and their branches use to transfer funds electronically, primarily for large fund transfers. FEDWIRE is described as follows:

> [FEDWIRE is] an electronic facility operated by the Federal Reserve banks used for (1) credit transfers of reserve balances among banks across the books of the Federal Reserve Banks and (2) the transfer among banks of book-entry U.S. government and agency securities in a delivery-versus-payment environment on the books of the Federal Reserve Banks. In 1990, the daily average number of funds transfers on Fedwire was about 255,000, with a daily average value of about $790 billion; the daily average number of securities transfers was about 45,000, with a daily average value of about $400 billion. [Ref. 16: p. 82]

Figure 2 provides a step by step schematic of a typical FEDWIRE transfer. Both credit and debit transfers are permissible via FEDWIRE. FEDWIRE transfers are also performed in real time (i.e., no delay) and are labor intensive, consequently they are relatively expensive transactions, at 10 to 20 dollars average cost per transaction [Ref. 1: pp. 14-15].

b. Clearing House Interbank Payments System (CHIPS).

CHIPS is operated exclusively for New York financial institutions by the New York Clearing House Association. Most international banking funds transfers are cleared through CHIPS. CHIPS is unique in that no monetary value changes hands until the end of the business day. Electronic bank account debits and credits are tabulated throughout the business day, and a final net debit or credit funds



Steps in the transaction:

Step 1: Company A instructs Bank A to transfer funds to Company B. Company A gives the bank number and account number of the payee.

Step 2: Bank A deducts funds from Company A's account.

Step 3: Via the FEDWIRE system Bank A sends instructions to the Fed to transfer funds to Bank B in favor of Company B. The reserve account of Bank A is debited by the amount of the transaction, and the reserve account of Bank B is credited by the same amount.

Step 4: After the value has been transferred by the Fed, Bank B is notified of the transaction.

Step 5: Bank B credits Company B's account by the amount of the transaction, and notifies the company.

A Typical FEDWIRE Transfer

[Ref. 1: pp.14-15]

transfer is made at the end of the day [Ref 1: p. 17]. Through its 130 (approximate number) participants, CHIPS averages 150,000 transfers, valued at about $890 billion each day [Ref 16: p. 82].

c. Society for Worldwide Interbank Financial Communications (SWIFT).

The SWIFT is actually an international electronic mail system that is used to transfer funds. SWIFT has no affiliation with the Federal Reserve. However, transactions made by SWIFT may interface with the other payment mechanisms that are operated by the Federal Reserve. SWIFT works as follows:

> SWIFT is actually a Value-Added-Network (VAN) operated for over 1600 member banks in 54 countries. SWIFT handles nearly one million messages each day. Each message is sent in the form of a proprietary SWIFT format designed to handle information relating to payment instructions, letters of credit, trade information, transaction confirmations, balance reports, deposit reports, etc. Since there is no Federal Reserve on an international basis, payments are cleared through correspondent account banks. [Ref. 1: p. 17]

SWIFT members are very active in EDI initiatives, in particular in international EDI protocols [Ref 1: p. 17], which will be discussed in the EDI discussion later in this chapter.

9. The Automated Clearing House Network (ACH).

The ACH network plays a vital part in the overall electronic payments system of the FRS. The majority of high volume, small dollar amount payments are transmitted via an ACH network, including most DoD contract payments which are sent electronically. The ACH network has expanded to include 29 Federal Reserve operated and 12 private ACH associations throughout the United States. Appendix B lists these

associations. NACHA, the nationwide coordinator for the ACH network, includes each of the 41 ACH associations as members of its board.

The 41 associations do not all "process" ACH transactions. Most are administrative offices, performing marketing, assistance to banks and corporations on rules interpretations, and coordination between the Federal Reserve and banking community on ACH matters [Ref. 17]. Presently there are four activities that actually perform the electronic data transmission: The Federal Reserve ACH System, VISANET, the New York Automated Clearing House, and the Arizona Clearing House [Ref. 17.]. The Monetary Control Act of 1980, by permitting competition for ACH services, was significant in instilling alternative ACH data processing sites in the U.S. payments system [Ref. 17]. From a national perspective, NACHA describes its role as follows:

> The Automated Clearing House System is designed to serve all depository financial institutions (DFI's), regardless of size, on an equitable basis. The basic relationship between DFI's and their customers, their correspondents, and the ACH remains essentially the same as under the paper check system. [Ref. 9: p. OG-3]

To understand the development of the ACH network a brief historical review will be provided.

a. Development of the ACH System.

As stated at the outset of this chapter, ACH's began as a solution to the overburdening growth of the paper check clearing system. Most ACH's contracted with the Federal Reserve for electronic payment services, while some operated their own facilities and settled transactions through their local Federal Reserve Bank [Ref. 9: p. OG-1]. The formation of NACHA in 1974 permitted the Federal Reserve to

establish standards for ACH networks nationwide. NACHA, in cooperation with the Federal Reserve, began linking the local ACH networks into a nationwide system throughout the late 1970's [Ref. 9: p. OG-1]. Different applications for transmitting payments and remittance information via EFT were developed throughout the 1980's. These applications will be discussed later in this chapter.

b. Overview of the ACH System.

An ACH transaction requires five participants, the Originator, Originating Depository Financial Institution (ODFI), Automated Clearing House Operator (ACH), Receiving Depository Financial Institution (RDFI), and the Receiver. The following passage defines the role of each participant:

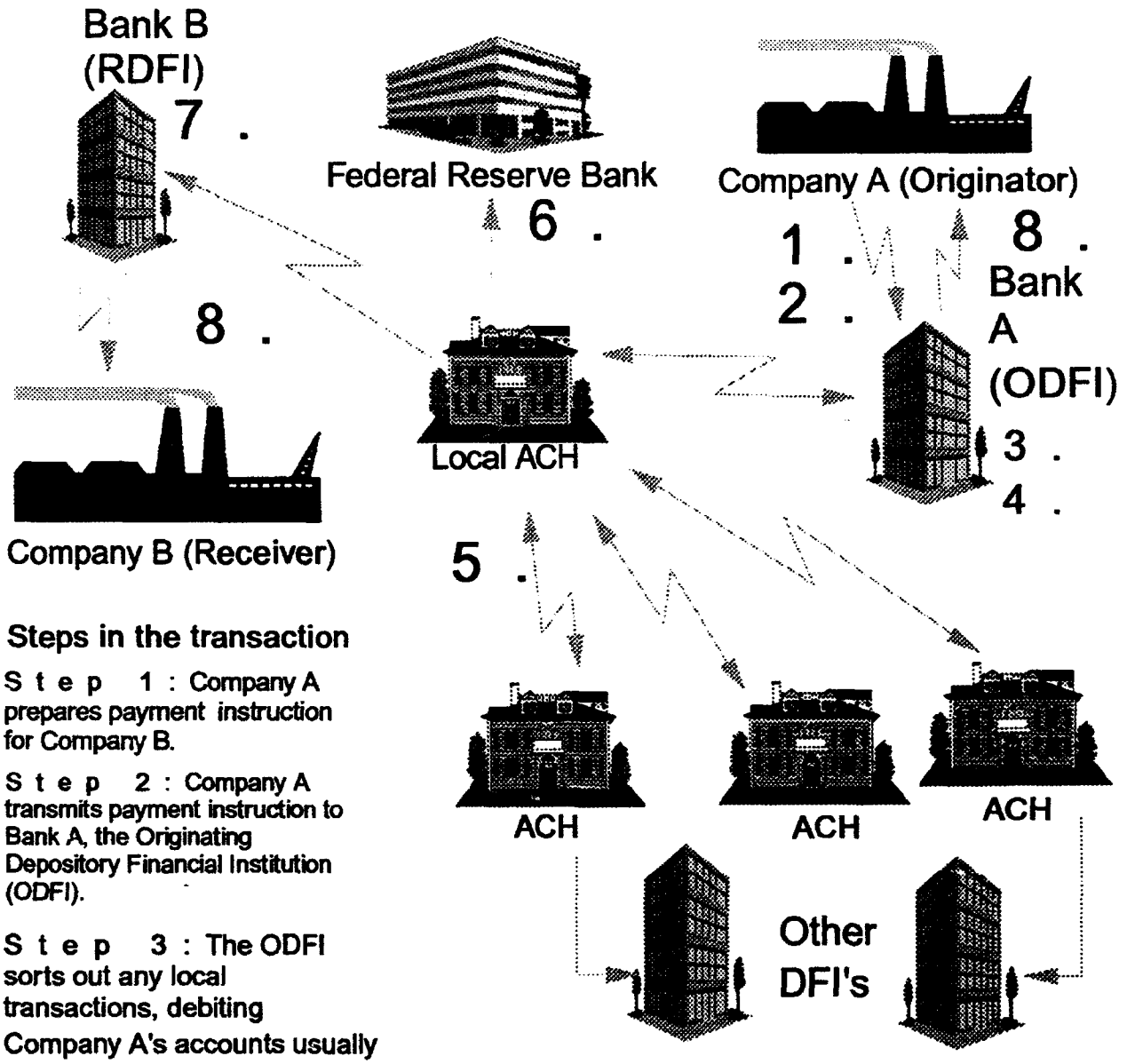
> **Originator:** The Originator is the entity that agrees to initiate *ACH entries into the payment system according to an arrangement* with the Receiver. The Originator is usually a company directing a transfer of funds to or from a consumer's or another company's account.
>
> **Originating Depository Financial Institution (ODFI):** The ODFI is the institution that received the payment instructions from Originators and forwards the entries to the ACH Operator.
>
> **Automated Clearing House (ACH) Operator:** An Automated Clearing House Operator is the central clearing facility, operated by a Federal Reserve Bank or a private organization, which receives entries from ODFI's, distributes the entries to appropriate RDFI's, and performs the settlement functions for the affected financial institutions.
>
> **Receiving Depository Financial Institution (RDFI):** The RDFI is the DFI that receives ACH entries from the ACH Operator and posts them to the accounts of its depositors (Receivers).

Receiver: A Receiver is a natural person or an organization wich has authorized an Originator to initiate an ACH entry to the Receiver's account with the Receiving DFI. [Ref. 9: pp. OG 3-4]

Figure 3 provides a flowchart showing a typical ACH transfer. ACH transfers typically support high volume, low dollar amount batch process transactions. As such, there is usually a one day lag between the time the originator initiates the payment and the time the receiver's account is credited.

c. The All Electronic ACH.

With the growth of the ACH system, so too grew the demands on the system. Between 1985 and 1988 the ACH phased in electronic point-of sale capabilities to be used for debit card transactions. Automatic Teller Machine (ATM) transactions, known as Machine Transfer Entries (MTE), and a host of accounting and information support functions are processed through ACHs [Ref. 9: pp. OG-1,2]. One of the drawbacks of the ACH system recognized in the 1980's was that much of the ACH data entry was still being performed manually, delivered by courier and loaded by magnetic tape or disk onto the system. Because the Monetary Control Act of 1980 opened up ACH services to competition, the ACH data processing center (Federal Reserve, VISANET, New York ACH, or Arizona ACH) that is most cost efficient will gain business at the expense of the others. This had an impact on the "all electronic ACH" decision [Ref. 17], in which NACHA mandated that "...all ACH operators provide a fully all electronic ACH network" [Ref. 9: p. OR-xv] with a target date of 1 July 1993 [Ref. 18: p. 22]. Besides the obvious cost benefits



Steps in the transaction

S t e p 1 : Company A prepares payment instruction for Company B.

S t e p 2 : Company A transmits payment instruction to Bank A, the Originating Depository Financial Institution (ODFI).

S t e p 3 : The ODFI sorts out any local transactions, debiting Company A's accounts usually on the following day.

S t e p 4 : The ODFI merges transactions from Company A and other companies for transmission to the local ACH.

S t e p 6 : The local ACH sends data to the Fed, debiting the ODFI account and crediting the RFI account held at the Fed.

S t e p 7 : The local ACH transmits data to Bank B, Company B's bank. This transmission contains all transactions pertaining to that bank.

S t e p 5 : The local ACH sorts out intra-regional transactions from interregional transactions. Inter-regional transactions are transmitted the following day.

S t e p 8 : The ODFI debits Company A's account, while the RDFI credits Company B's account, usually on the following day.

Figure 3: A Typical Automated Clearing House Transfer

[Ref. 1: pp. 15-16]

associated with mandating the all electronic ACH, there are other advantages, as follows:

> The big payoff, however, will come from the ability to eliminate the 4-6 hours set aside each night for the delivery of ACH files via courier. This will, in turn, allow deposit deadlines to be moved to later in the evenings, which should attract new transaction volume. [Ref. 18: p. 22]

The advantage of backing up ACH deadlines is a real one, especially for activities such as DFAS-Columbus Center, which must meet the electronic payment deadlines from the FRB each day (this will be discussed further after reviewing the payment process at DFAS-Columbus Center).

The volume of transactions handled by the ACH network has grown from approximately $100 million in 1976 to more than $1.5 trillion in 1991 [Ref. 18: p 21, Figure 1]. Within the Federal Government, ACH payments have grown steadily, surpassing the number of payments made by check for the first time in 1991 [Ref. 7: p. 729].

d. Laws and Regulations Governing the ACH Network.

The FRS regulates the ACH network by means of its Uniform Operating Circular (UOC). The UOC incorporates many of the applicable laws, regulations, and operating rules regarding ACH's,including:

- Uniform Commercial Code, Article 4A (for credit items)
- The Operating Rules of NACHA
- The Operating Rules of local ACH Association
- U.S. Code of Federal Regulations (31 CFR 202, 209, 210, 370) [Ref. 9: p. UOC-1., Ref 19]

The Federal Government has its own separate ACH operating rules published by the Treasury's Financial Management Service (FMS), known

simply as The Green Book [Ref. 19]. The Green Book is an easy to read, "how to" guide for Federal Agencies in FMS services such as Direct Deposit, Vendor Express (which will be discussed later), as well as information on the ACH network [Ref. 19]. It is updated annually.

The Uniform Operating Circular (UOC) covers general topics such as settlement agreements, security, and ACH time schedules, while leaving the more detailed instruction to the NACHA and local operating rules. NACHA and local operating rules are updated and published annually.

e. Will ACH electronic payments displace paper checks?

The quick answer to this question is "no". However, it does merit some consideration. For the typical consumer the paper check is a well accepted, comfortable means of payment. Many consumers like the feel of a paycheck in their hands, not trusting direct deposit methods. In the analysis portion of this study, there are difficulties associated with electronic payment which the contractor survey reveals. Many contractors feel that payment by check is simpler than electronic payment.

Another hurdle to overcome in displacing paper checks is the banking industry itself. Paper check clearing services are big business and a profitable endeavor for most banks, as the following passage describes:

> A critical economic distinction between electronic payments and checks is that electronic payments involve a relatively high fixed cost with very low variable cost. For a business to justify investment in new systems and conversion to electronic payments, it requires volume. For a bank to justify investment in a higher fixed-cost payment service, it must consider not only the issue of adequate volume but also the potential loss of existing check-based business. Viewed across the entire banking industry, the problem is more than just volume. To the extent that individual banks would have to invest in relatively high fixed-cost delivery support systems, the logical long-run industry structure is a few low-cost service providers. Hence, banks, anticipating an erosion of profitable check and other non-electronic payment services and a long run loss of business, are reluctant to invest in electronic payment services. [Ref. 20: p. 23]

One other issue which is inhibiting the expanded use of electronic payment mechanisms is the "float" issue, float being the lag time between the time a check is issued and when it is actually debited from the issuer's account. The issue of float is one of the questions asked in the contractor electronic payment survey, which will be covered in Chapter IV.

10. Summary of the Federal Reserve System.

The information provided here merely highlights the functions of the Federal Reserve. The important ideas to be taken from this discussion is that the FRS is the critical cornerstone of the banking industry, providing valuable financial and data processing services and helping to prevent financial instability for the U.S. and international financial markets. The FRS has been a pioneer in electronic financial payments, and yet has come under scrutiny as both the service provider and regulator for the banking industry. Despite the criticisms, by its very existence the FRS adds stability and integrity to the banking industry.

C. OVERVIEW OF ELECTRONIC PAYMENT APPLICATIONS.

The previous discussion has outlined the infrastructure within which electronic payments are made. The actual mechanism by which these payments are made is Electronic Funds Transfer (EFT). EFT payment applications will now be addressed, as will the relationship between EFT and Electronic Data Interchange (EDI).

1. Electronic Funds Transfer (EFT).

a. Definition.

The ACH network, Fedwire, CHIPS, and SWIFT network are systems with one objective in mind: to transfer value from one bank to another in a secure, structured manner. In its strictest sense, EFT refers only to the actual value transfer process, as the following definition from the Code of Federal Regulations describes:

> Electronic fund transfer means any transfer of funds, other than a transaction originated by check, draft, or similar paper instrument, that is initiated through an electronic terminal, telephone, or computer or magnetic tape for the purpose of ordering, instructing, or authorizing a financial institution to debit or credit an account. The term includes, but is not limited to, point-of-sale transfers, automated teller machine transfers, direct deposits or withdrawal of funds,and transfers initiated by telephone. It includes all transfers resulting from debit card transactions, including those that do not involve an electronic terminal at the time of the transaction. The term does not include payments made by check, draft, or similar paper instruments at an electronic terminal. [Ref. 21: Section 205.2(g)]

What distinguishes EFT from EDI and Financial EDI is that EFT involves only banks: EDI and Financial EDI can involve banks and/or other entities, and does not involve the transfer of value, only data [Ref. 1: p. 13]. While a corporation or other entity may initiate an electronic

payment transaction, the only time that actual value changes hands is when the two banks actually debit or credit their accounts. Transactions involving EDI and Financial EDI may involve more partners. EDI and Financial EDI will be discussed in greater detail later in this chapter.

b. EFT Applications.

Each of the four electronic payment systems previously identified for EFT transmission have their own mechanisms for initiating and receiving an EFT transaction. The focus here will be on the ACH standardized formats, since the ACH is the primary means through which DoD electronic payments are made. There are three primary formats used by the banking industry: Cash Concentration and Disbursement (CCD/CCD+), Corporate Trade Payment (CTP), and Corporate Trade Exchange (CTX). Each format is described below.

(1) Cash Concentration and Disbursement (CCD/CCD+). This was the first EFT mechanism used by the Treasury and Federal Reserve in 1974, and it is still the most widely used today [Ref. 22: p. A-1]. The CCD is a formatted line of data, 94 characters in length, used to transmit payment information only (such as bank number, account numbers, and dollar amount of the transaction) [Ref. 1: pp. 16-17]. The shortcoming of the initial CCD format was the lack of pay remittance information, such as invoice data. To provide for remittance data, NACHA approved the use of one addendum record, 80 characters long, for each CCD payment instruction. This updated format was referred to as CCD+ (CCD plus addendum) [Ref. 22: pp. A-1,2].

(2) Corporate Trade Payment (CTP). This format was developed as a pilot project in 1983 by NACHA to try to expand upon the amount of remittance information that could by passed in the CCD+ format. The following passage describes the development of the CTP format:

> The essence of the CTP transaction format is an ordinary, 94-character payment record that will handle payments in the same form as the CCD transaction. However, this record would have attached to it an information addendum. The format for the addendum is 16 to 4,990 94-character records. The company's payment advice would be packed into these 94-character records. [Ref. 23: p. 19]

Effective April 2, 1993, the number of addenda records permitted using the CTP format has been increased to 9,999 [Ref. 9: p. OR-ii]. The CTP format has not been well accepted by the banking industry or U.S. corporations. (Sears, Roebuck, and Company is the largest user of the CTP format [Ref. 22: p. A-2].) The CTP format has been described as "...a flawed implementation of a basically good idea...." [Ref. 20: p. 20]. The problems associated with the CTP format are:

- No Data Standard. There was no explicit provision for any data content standard in the CTP addenda information. In effect, this electronic addenda was really an electronic letter that could be printed out by the receiving company but could not be understood by the receiving company's computer.

- Fixed-Length Records. The CTP addendum structure implicitly assumed fixed record lengths. While this was compatible with the use of fixed-length records in the internal data processing systems of most companies, it was inconsistent with the emerging data content standards for electronic data exchange, which used variable length record structures. It was also inconsistent with the use of variable length messages in S.W.I.F.T., an electronic network for international banking transactions.

- Electronic Delivery. There was no provision in the design of the Corporate Trade Payment service to enable the receiving bank to deliver the addendum information to the receiving company in an electronic transmission. The form of addendum data delivery was up to the receiving bank. Software to handle delivery would have to be done on a custom basis. Most of the CTP pilot banks produced a computer printout in the pilot test. Even after the pilot was complete, most banks continued to produce computer printouts of the addendum data and could not deliver it electronically.

- Discretionary Transactions. The CTP transaction was discretionary rather than mandatory. Therefore, there was no guarantee that a particular company's bank would be able to receive and process the CTP transaction. After the pilot, few banks beyond those participating in the pilot became CTP service banks. [Ref. 23: p. 20]

The CTP format is still used today by a few banks and corporations. However, it is widely recognized as an evolutionary EFT payment application.

(3) Corporate Trade Exchange (CTX). The CTX format was developed in 1985 by NACHA, and is the first banking EFT application which is compatible with EDI standards. This application permits an EFT transaction to take place using the ACH network, but the data can be in an EDI format [Ref. 1: p. 17]. The EDI format used with CTX is the ANSI X.12 820 (payment order/remittance advice) transaction set, which will be discussed later. A CTX transfer "...is essentially an ANSI X.12 820 wrapped in an ACH envelope." [Ref. 1: p. 17] The CTX format permits variable length data records vice the fixed length requirement of CCD+ and CTP. For each CTX payment instruction, there can be 9,999 additional lines of variable-length addenda records attached (also effective April 2, 1993).

The expanded use of the CTX format has been slow. Criticism has been directed at the banking industry for "foot dragging" [Ref. 24: p. 26] by not being more proactive in EDI initiatives, such as the CTX format which combines EFT with EDI. However, the banking industry points out some difficulties with the CTX format, namely:

> ...[CTX] is still a discretionary transaction. At this time there are very few banks committed to supporting the CTX transaction, either as originators or as active receivers. Moreover, there is no explicit provision for electronic delivery by the receiving bank. There is no standard software available so that the receiving bank can handle the electronic addenda. The receiving bank must decide how it will deliver the addenda information and implement its own system. Another problem is a lack of a standard communications interface between the receiving bank and receiving companies. [Ref. 23: p. 21]

The CTX format is well suited to transmit large amounts of remittance data along with the payment instruction. Since payments are typically for one invoice at a time, the CCD+ format is still used the most in the ACH network.

c. Regulating EFT.

The rules which apply to the ACH network (NACHA Rules) cover the use of the CCD+, CTP, and CTX formats. By incorporation the Federal Reserve's Uniform Operating Circular on ACH's gives the FRS control over the ACH's EFT payment applications. In general EFT laws and regulations are not succinct, as the following passage states:

> ...Electronic funds transfer is covered by a "patchwork of laws and regulations". Consumer (retail) funds transfer is governed by the Electronic Funds Transfer Act of 1978 (and Federal Reserve Regulation E), the Truth-in-Lending Act, Comptroller of the Currency Consumer Protection Guidelines, some state electronic funds transfer laws, and others. Wholesale wire transfer [FEDWIRE] has far less coverage. Regulation J governs parts of the typical FEDWIRE transaction, while CHIPS is covered by network rules and regulations subject to conditions required for access to Federal Reserve net settlement. There is a smattering of case law regarding wholesale wire transfer, but it hardly represents a coherent framework. [Ref. 25: p. 147]

In 1989, Article 4A of the Uniform Commercial Code was drafted to deal specifically with electronic payments issues [Ref. 25], adding to the list of regulations. Referring back to the recommendations made in the 1977 report by the National Commission on Electronic Funds Transfers, EFT was to remain "free from unnecessary regulation" [Ref. 10: p. 4]. While the description above implies that excessive regulation exists, it appears to be accepted as one of the "necessary evils" of the banking industry, which is already heavily regulated.

d. Vendor Express and Fedline/Fedline II.

(1) Vendor Express. The U.S. Treasury markets its ACH service to all Federal Government contractors (including DoD's) as Vendor Express. Vendor Express is:

> ...Direct Deposit for businesses (vendors) that provide goods and services to any Federal Agency. These payments are made electronically through the Automated Clearing House (ACH) network for deposit directly into the designated bank account on the payment due date. [Ref. 26: p. 3]

Contractors that want to receive electronic payment will enroll with Vendor Express through the agency they are contracting with. Vendor Express utilizes the CTX, CTP, and CCD+ ACH applications, but the CCD+

is the primary method used [Ref 26: p. 3]. Government agencies and contractors which are enrolled in Vendor Express can obtain assistance from any of the seven FMS Regional Finance Centers.

(2) Fedline/Fedline II. Fedline is the communication link between the Government agency (depository institution) initiating the payment and the Federal Reserve. The following description summarizes the functions of Fedline:

> Fedline is a PC-based software package developed by the Federal Reserve for access to a range of services. One of these services is the Automated Clearing House.
>
> Fedline basically provides data entry and editing capabilities to allow Federal Reserve customers to create ACH transactions in the formats required for these payments, which are defined by the National ACH Association (NACHA). Fedline also provides a communications capability to transmit a file of ACH payments to a Federal Reserve Bank for processing by the ACH system. [Ref. 27]

e. Summary of EFT.

What has been discussed here has been the mechanics of EFT and a brief introduction to the way EFT and EDI interrelate through the CTX format. The concept of EFT is relatively simple once it is understood. The mechanics of how an EFT transaction works can be complex, but it is not as important as is understanding the impact EFT can make on the way a business (or Government) conducts its accounts payable/receivable activities and performs cash management. These are the issues which will be explored in Chapters IV and V, following a further review of EDI and Financial EDI.

2. Electronic Data Interchange (EDI).

While EFT has made significant changes within the banking industry and in the way payments are made, EDI has the potential to go beyond EFT, to change entire business processes, not just the payments function. To understand the full impact of EDI, it should be looked at in light of how it can change an organization's internal processes, as well as how it changes the relationship that the organization has with its external trading partners. Internally EDI can be used not only to automate processes but also to help change the processes altogether, eliminating redundant functions that do not add value to the process. EDI can be used to:

> ...reengineer our businesses: use the power of modern information technology to radically redesign our business processes in order to achieve dramatic improvements in their performance.
>
> [Ref. 28: p. 104]

To see why this is possible, it is necessary to broaden the definition of EDI provided in Chapter I:

> Electronic Data Interchange (EDI) is the exchange of routine business transactions in a computer-processable format, covering such traditional applications as inquiries, planning, purchasing, acknowledgements, pricing, order status, scheduling, test results, shipping and receiving, invoices, payments, and financial reporting. [Ref. 29: p. 7]

As this definition suggests, EDI has weaved its way into almost every function of business today. As such, an organization can use EDI as a tool to help "reengineer" those processes within the organization.

The relationship an organization has with its trading partners is likewise impacted by EDI, as the following passage suggests:

> Like many acronyms, EDI has been worn meaningless through time. Electronic Data interchange, in itself, simply refers to any transfer of data from one computer to another. What distinguishes EDI from other communications technology is that it posits the exchange of information from one corporation to another.
> [Ref. 30: p. 15]

The concept of a "trading partnership" is a relatively new approach to business relationships, especially for DoD and defense contractors, where the relationship between Government and contractor has often been adversarial. Consequently, EDI presents some major opportunities for DoD, both with its internal processes (e.g., sharing data between DoD contracting offices) and its external relationships (e.g., transmitting contract solicitations, awards, modifications, etc.)

a. Benefits of EDI.

There are numerous benefits associated with EDI. The DoD recognizes some of them in the following passage:

> The benefits of EDI extend far beyond a decrease in paper: more accurate records, lower data entry costs, elimination of mailing costs, decreased paper handling, greater customer satisfaction, reduced inventory, better cash management, reduced order time, and more accurate information for management. [Ref. 4: para 1.4.6]

One of the most significant changes to business processes which EDI permits is the reduction of paperwork. Documents are transmitted electronically, data fed directly from one computer system to another, without manual data entry. No paperwork changes hands. This is an easy concept to explain, but a difficult concept to implement. Another important concept with EDI is its "transparency" to the end user [Ref. 31]. EDI users need not know the mechanics of how EDI transactions take place; they will perhaps learn a few EDI transmission steps (i.e.,

sending and receiving documents), but otherwise they are unaware of the process.

b. EDI History and the American National Standards Institute.

Electronic transmission of data has undergone an evolutionary process similar to EFT. Before the 1970's data transmissions were limited to two trading partners, using proprietary formats, exchanging industry-unique information [Ref. 29: p. 7]. EDI, as it is known today, developed as follows:

> In the 1960's some industry groups began a cooperative effort to develop industry EDI standards for purchasing, transportation, and financial applications. Eventually the idea of national standards for use across industries received substantial support from a number of different industries.
>
> In the late 1970's...[the American National Standards Committee's Accredited Standards Committee] ASC X12 began the development of its first standards for electronic data interchange. [Ref. 29: p. 7]

Each EDI standard represents one transaction set, the electronic equivalent of a business form, such as an invoice, purchase order, etc.

In the United States the American National Standards Institute (ANSI) provides the forum by which industry standards are agreed upon. The following is a brief synopsis of ANSI's role:

> The American National Standards Institute (ANSI) was founded in 1918 as the coordinator for national standards in the United States. The U.S. voluntary standards system consists of a large number of standards developers that write and maintain one or more national standards. Among them are professional societies, trade associations, and other organizations.
>
> ANSI provides an open forum for all concerned interests to identify standards needs, plan to meet those needs, and agree on standards. ANSI itself does not develop standards. [Ref. 29: p. 3]

The Accredited Standards Committee (ASC) X.12 was chartered in 1979 to help develop the EDI standards within ANSI [Ref. 29: p. 3]. The X.12 Committee is comprised of over 500 members from most industries. The Committee convenes three times each year to identify new requirements, draft new standards, approve trial use of the standards, and select those standards for "national public review" [Ref. 29: pp. 4-5]. Once a standard has completed public review successfully, it is published as an ANSI standard [Ref. 29: p. 5]. The ANSI EDI standards are typically referred to by their three digit number (e.g., invoice is ANSI 810, payment order/remittance advice is ANSI 820). There are in excess of 100 published standards, with more in the development and approval process.

In the international community, the Electronic Data Interchange For Administration, Commerce and Transport (EDIFACT) standards have been developed in parallel with the ANSI X.12 standards. The United Nations Economic Commission for Europe - Working Party (Four) on Facilitation of International Trade Procedures (UN/ECE/WP.4) developed the EDIFACT standard [Ref. 32: p. 1,2], which is used primarily by the European Common Market [Ref. 33].

The U.S. Government has been an active proponent of the use of EDI. In May 1988, Deputy Secretary of Defense Taft issued a memorandum directing DoD activities to "...make maximum use of electronic data interchange (EDI) for the paperless processing of all business related transactions" [Ref. 3: p. 1-1] In March 1991, the Commerce Department's National Institute of Standards and Technology (NIST) announced the

adoption of the ANSI X.12 and European EDIFACT standards, which "...requires the use of X12 or EDIFACT...when Federal departments or agencies implement EDI systems" [Ref. 32: p. 1]. The Commerce Department's NIST determines those standards to be used by the Federal Government.

c. The EDI Format.

The format of an EDI transaction is not as important as the documents that it replaces and the impact EDI makes on an organization's business processes. Consequently, the discussion of a transaction set structure will be general. One critical feature of EDI is that it is a batch process method of transmitting data, thus requiring minimal telecommunication time and cost. A typical EDI transaction is comprised of the following elements:

- Electronic Envelope: A "catch all" term for the electronic address, communications transport protocols, and control information. It is the electronic analog of a paper envelope, (i.e., a communications package).

- Functional Group: One or more transaction sets for the same business application such as purchase orders or invoices. Thus, it is a collection of electronic document images for the same business application.

- Transaction Set: Each transaction set is an electronic document (i.e., invoice, purchase order, etc.)

- Data Segments: The contents of each transaction set are the data segments (document lines, information categories). This is the actual data. [Ref. 23: p. 12]

d. Translation Software.

In order for an organization to take advantage of EDI, it must be able to convert its in-house computer applications to the ANSI X12 format. This process is referred to as data mapping [Ref. 2], which requires translation software. Commercial software packages are available, depending upon the type of transactions the organization wishes to convert to EDI. The DoD Implementation Guidelines for EDI, Volume II, provide the data mapping standards for DoD. Figure 4 outlines the translation process as a simple flow chart.

e. Value Added Networks (VAN).

The true value of EDI cannot be realized without being able to communicate with other organizations, commonly referred to as trading partners. Maintaining an active electronic link between all of one's trading partners is not practical, considering telecommunications costs and computer access time. Computer communication protocols differ, and such differences can prevent computers from communicating. In addition, the batch processing capabilities of EDI would be underutilized in a direct computer link. One industry which has grown to fill many of these needs is the Value Added Network (VAN). Value Added Networks

> ...specialize in helping businesses set up EDI trading relationships from start to finish and then manage communications to ensure that EDI connections always are available, reliable, and secure. VANs accomodate for disparities in equipment software and communications capabilities between trading partners. VANs can even enable EDI translations with trading partners who are not EDI capable. [Ref. 34: p. 6]

One beneficial function of VANs is providing electronic mailbox services. VAN participants can transmit their EDI transactions in a

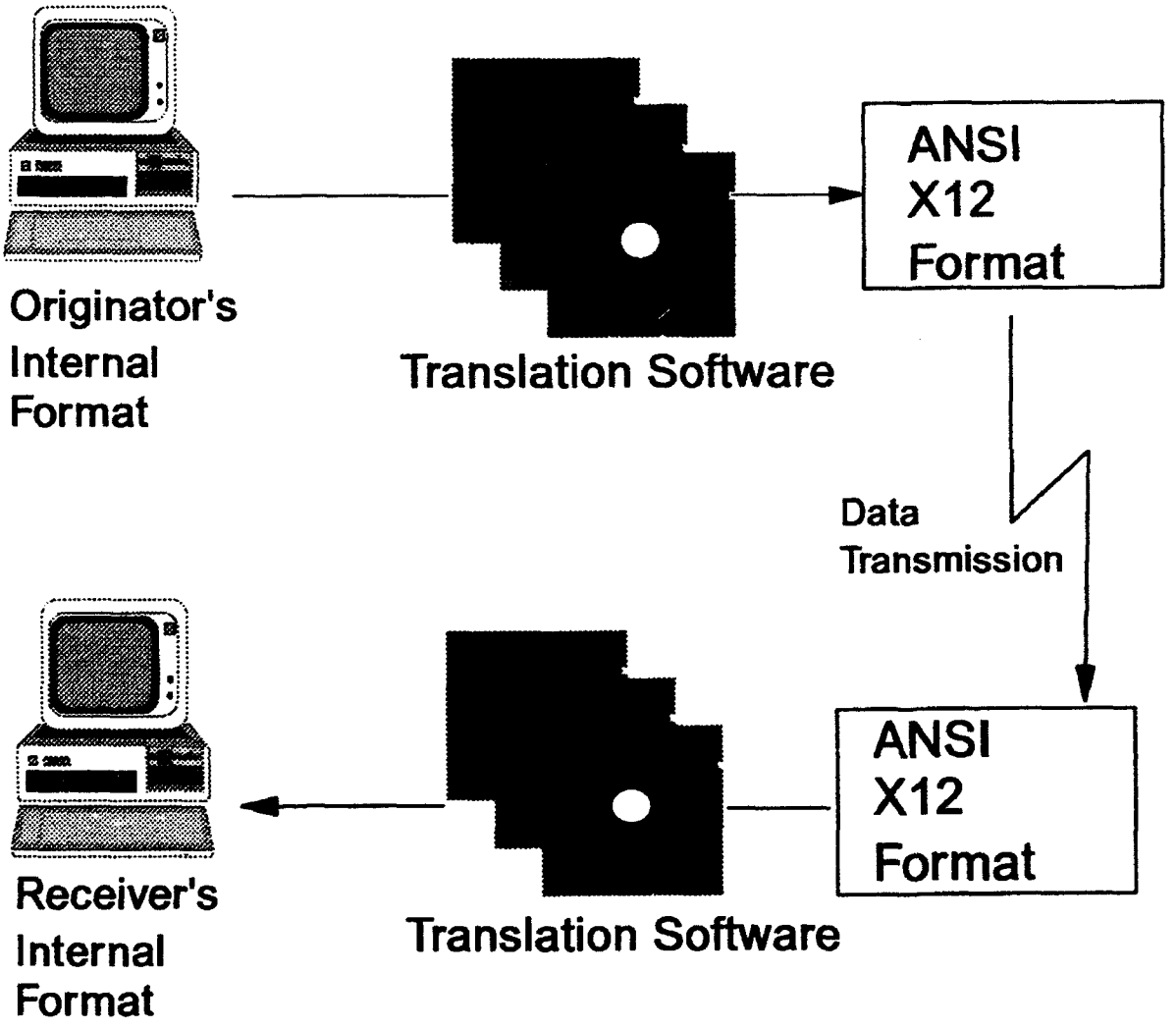


Figure 4: Translation of Internal Application To the EDI Format

[Ref. 23: p. 11]

batch into the VAN; the VAN will route the transaction to the recipients electronic mailbox and hold it there until the recipient is ready to receive the transmission. VANs can also communicate with other VAN networks, in what are called "gateway" VANs [Ref. 35: p. 18].

f. A Typical EDI Business Cycle Using EDI Transactions.

The true benefit of EDI can be seen when a typical business transaction is diagrammed, with the EDI transaction replacing the equivalent paper document. Figure 5 provides a typical business transaction using EDI. Incorporated into the figure is the EFT process discussed earlier in this chapter. Three key points can be made about EDI upon examining the process. First, while EDI is comprised of individual transaction sets (i.e., invoice, acceptance, payment), EDI achieves its greatest benefit when an EDI "system" is developed, encompassing entire business processes. Second, the concept of transparency is important to EDI. To the end user, none of the software translation, communication protocols, or ANSI standards need be known. Once a transaction is entered into the users computer system, EDI removes the user from the traditionally manual processes of mailing the document, checking for errors, and routing it to the correct office. Transaction approval may be the only step necessary throughout the entire EDI process. The third key point is that EDI permits the instantaneous transmission of information. This allows concepts such as Just-In-Time (JIT) delivery and Cash Management to benefit from immediate information. Private industry and the Federal Government

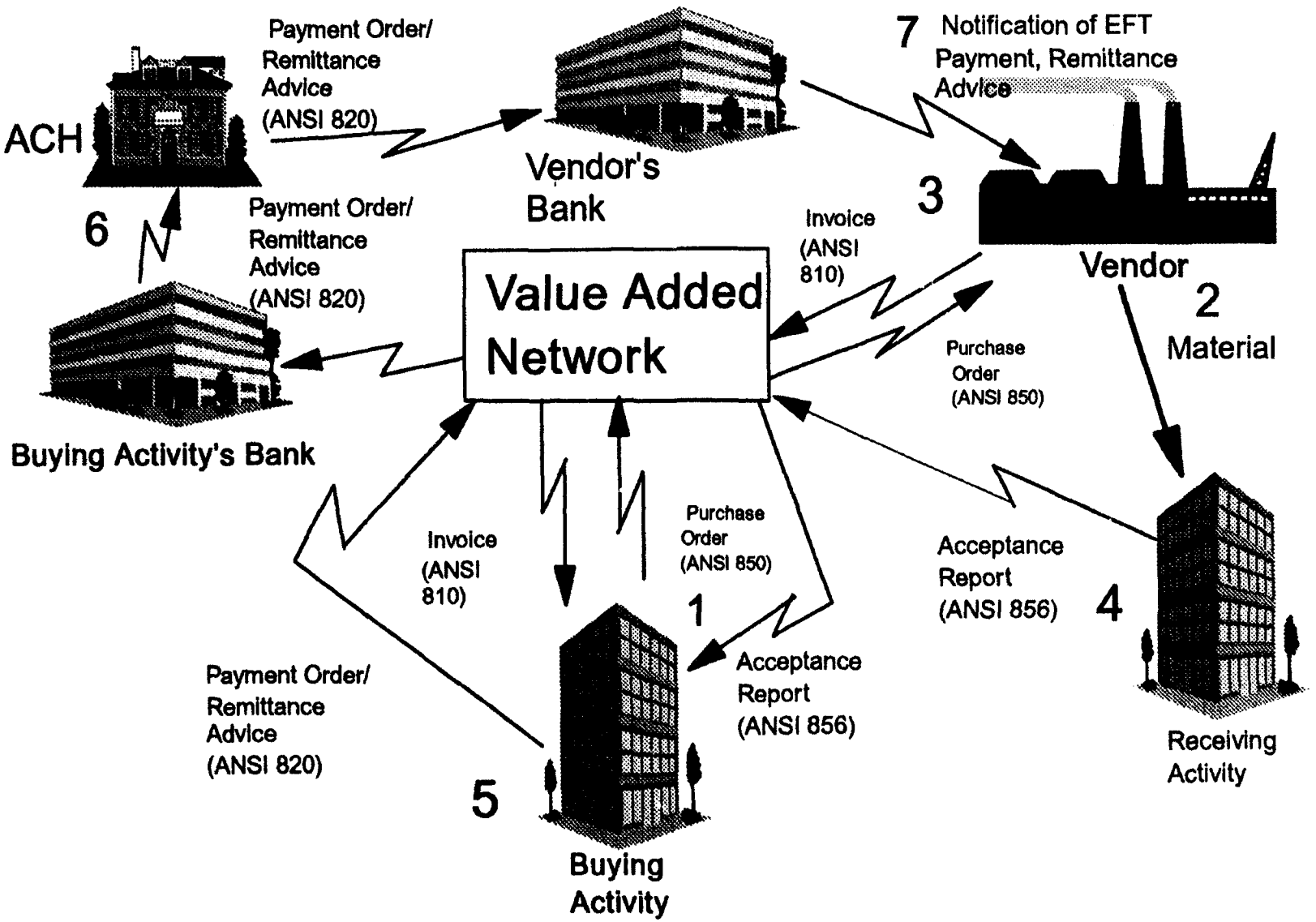
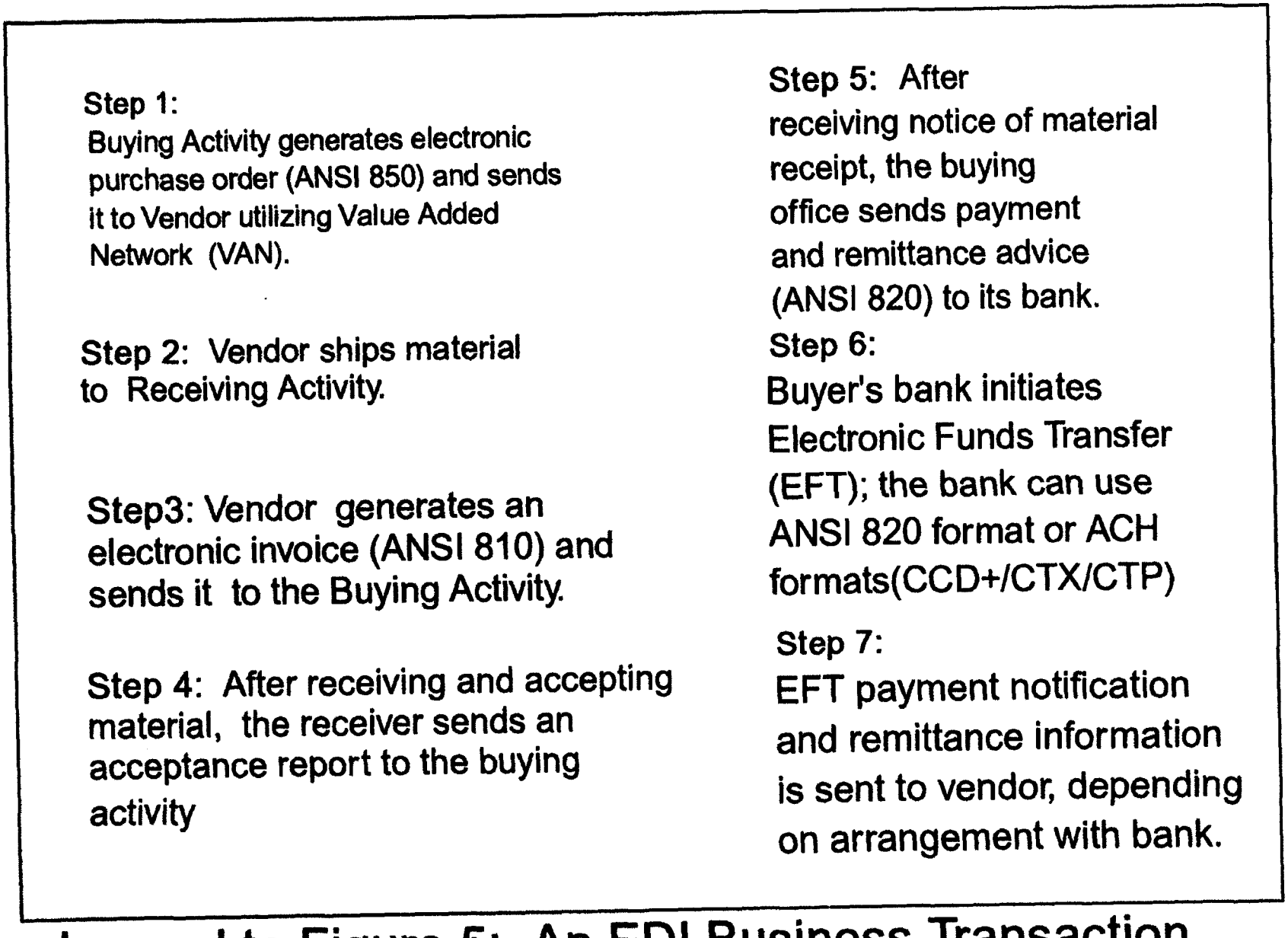


Figure 5: An EDI Business Transaction
[Ref. 36: Fig.1-5]



Legend to Figure 5: An EDI Business Transaction

[Ref. 36: Fig 1-5]

recognize these benefits, so it appears that EDI will continue to grow as a necessary competitive tool for organizations now and in the future.

3. Financial EDI.

a. Defining Financial EDI.

Financial EDI has been described as "...the electronic movement of payments and payment-related information...." [Ref. 37: p. 19] The differences between EFT, EDI, and Financial EDI can be confusing. In its simplest form, Financial EDI can be thought of as a subset of EDI that can include the EFT function in it. Business entity's can perform Financial EDI through interaction with their banks, however they do not perform EFT, which is strictly a banking function.

While the EFT applications (CCD+/CTP/CTX) permit the transmission of remittance data through use of addendum records, the business community, expanding its own use of EDI, began developing its own standards. General Motors (GM) was at the forefront of the development of Financial EDI through use of the ANSI 820 (now ANSI 820A) standard [Ref. 22: p. A-3]. The following passage describes why industry has supported the use of ANSI 820A:

> The ASC X12 developed the ANSI 820A standard in response to a demand from industry for a payment exchange standard that meets EDI syntax requirements. It permits corporations to instruct financial institutions to transfer payments and to exchange information directly between trading partner's accounts-payable and accounts-receivable systems.

> The ANSI 820A standard has three primary advantages over the NACHA payment options. It uses a variable length format that is more efficient than the fixed length formats of the NACHA standards; it is supported by an industry of translation software vendors providing "off-the-shelf" capability to translate user application information into the EDI format; and it satisfies a DoD priority to expand the use of EDI. [Ref. 38: p. 2-2]

While this passage does explain why the ANSI 820A transaction set was developed, a point of clarity is necessary. The CTX transaction set was developed to permit flexible-length format to accomodate the ANSI 820/820A transaction set format. Although CTX supports ANSI, CTX is still not widely used by banks:

> Unfortunately, few banks have the capability to process CTX formats. Based upon a 1991 NACHA estimate, only 100 financial institutions currently have the capability to originate and receive CTX transactions. [Ref. 38: p. 2-3]

The CTX format appears to have been the banking industry's response to demands for a financial EDI mechanism. The ACH network does not support the ANSI 820/820A as a stand-alone transaction, but only if it is enveloped by the CTX format. Consequently, the vast ACH network operated by the Federal Reserve offers very limited financial EDI capabilities [Ref. 38: p. 2-2].

b. Value Added Banks (VABs).

Some commercial banks have taken the initiative and actively pursued EDI as a future business opportunity. Many banks now accept the ANSI 820/820A transaction set, along with at least one of the three ACH applications. Some banks are going further into EDI, referred to as "Value Added Banks" (VAB) by the EDI industry. One definition offered for a VAB is as follows:

> A VAB is a bank which provides education and consulting expertise to corporate and institutional customers as those customers plan, implement, and utilize Financial EDI, and provides a wide array of financial EDI operating services which enable the companies to achieve their productivity goals in Treasury, Accounts Payable, and Accounts Receivable operations. [Ref. 39: p. 41]

Value Added Banking is likely to become one of the more rapidly growing services out of the EDI industry. For an organization to be successful in developing its Financial EDI capabilities, it depends heavily on the service they receive from their bank. Evaluation of bank support for EFT and EDI is one of the areas covered by the contractor EFT survey conducted as a part of this study. These results will be discussed in Chapters IV and V.

4. An Example of the Benefit of EDI - The ANSI 824 (Application Advice).

As the EDI customer demands greater capabilities, additional EDI transaction sets are developed and approved. As an example, the ANSI 824 transaction set, Application Advice, can provide a valuable time-saving function for its user.

A frequently cited task performed by Defense contractors is making inquiries regarding invoice payment to the DoD paying office. The contractor wants to find out if their invoice has been accepted for payment, or if it has errors which will delay payment. An erroneous invoice would normally require mailing the erroneous invoice back to the contractor, correction, and mailing it back to the paying office. This process could take from several days to a few weeks, if not longer. In an EDI environment, the ANSI 824 would make the response time instantaneous. ANSI 824's function is designed to:

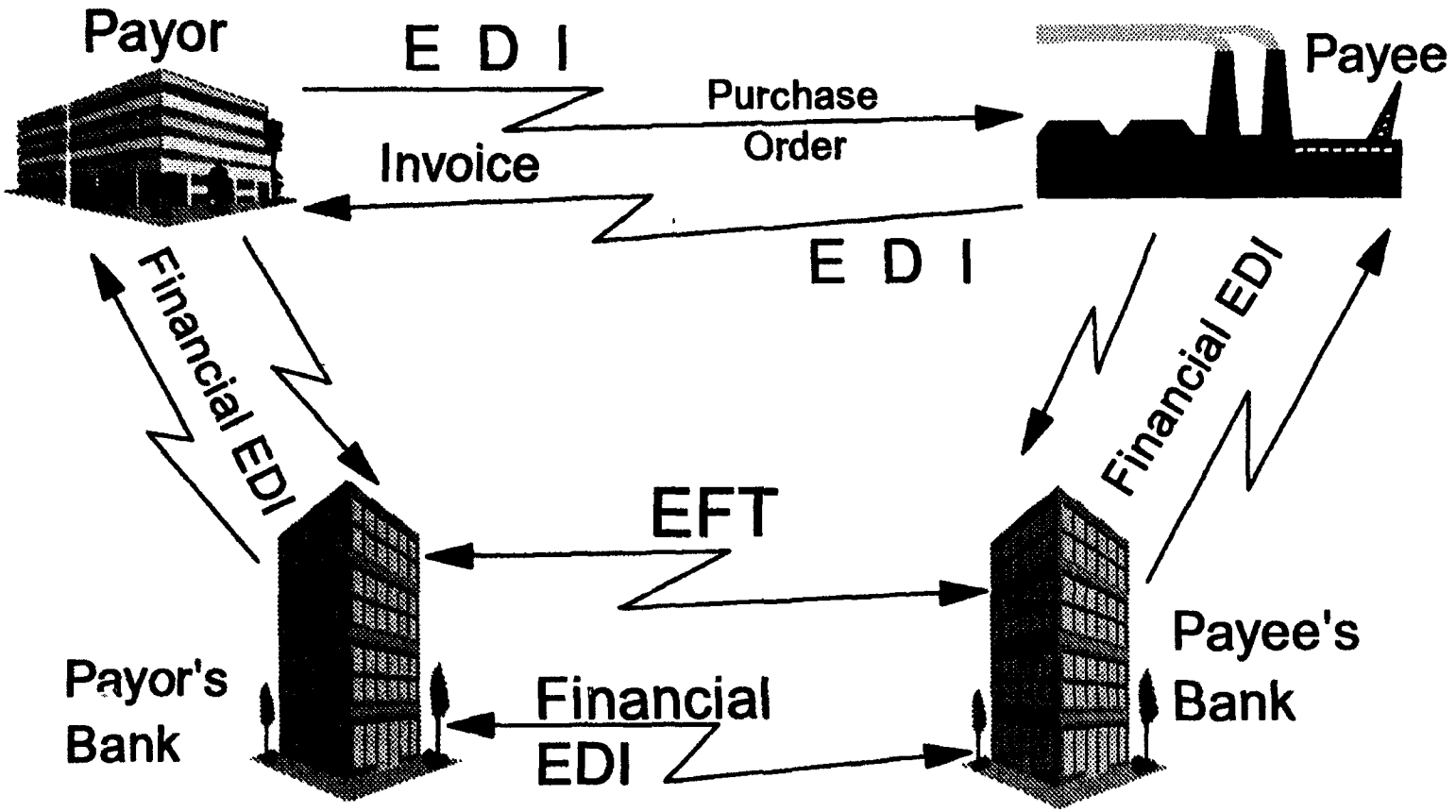
> ...accommodate the business need of reporting the acceptance, rejection, or acceptance with change of any transaction set.
> [Ref. 40: p. 411]

Use of the ANSI 824 transaction set would permit electronic invoices, receipt documents, etc., to be immediately acknowledged by the recipient as correct or not. If not, an explanation can be given. In an electronic environment, the document mailing process is eliminated, the contractor finding out the following day the status of document acceptance. This type of information could save many hours of manual inquiries between contractor and paying office, as well as speeding up the invoice processing timeframe.

5. Summarizing EFT, EDI, and Financial EDI.

Figure 6 provides a flow chart depicting the relationship between EFT, EDI, and Financial EDI. The distinction is important because an organization, either implementing EDI or expanding it, needs to understand that the type of information and service they receive depends on the type of electronic payment applications they are using. Other factors include the type of trading partner relationship it will require, what information can they expect to receive, and what the limits of their system are.

In the next section, the discussion will focus on the way DoD pays its contractors: the computer systems, DoD agencies, and processes that make up the process through which a "typical" invoice is channeled for payment. Following this overview, the EFT and EDI initiatives underway in the payment process will be analyzed.



EDI: Firm to Firm transmission of data.
EFT: Bank to Bank transmission of value and data.
Financial EDI: Firm to Bank, Bank to Firm, Bank to Bank transmission of data. Bank to Bank may transmit value with data.

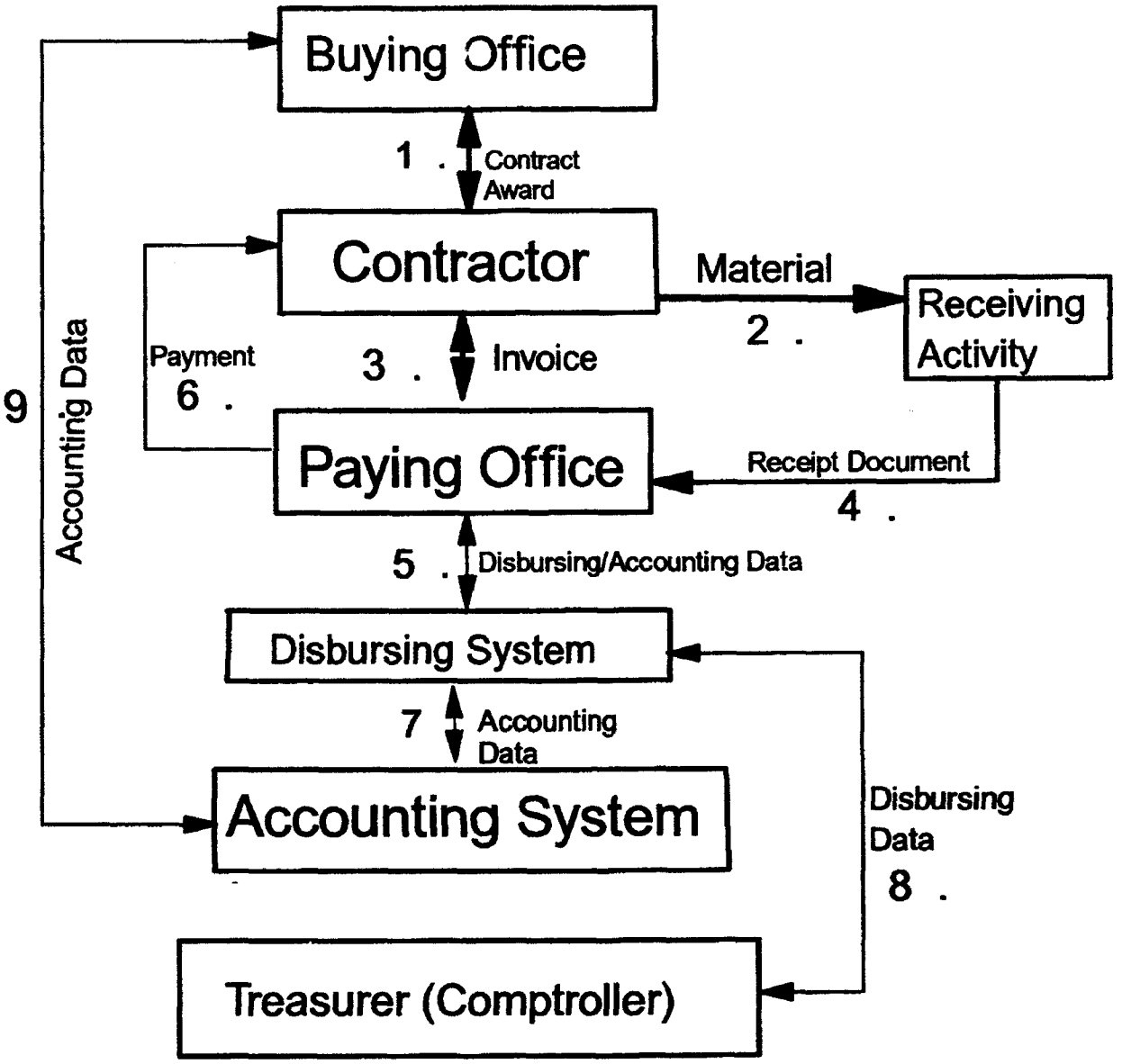
Figure 6: The Relationship Between EDI, Financial EDI, and EFT
[Ref. 1: p. 13, Figure 2]

D. THE DoD CONTRACT PAYMENT/ACCOUNTING CYCLE.

1. A Conceptual Pay and Accounting Cycle.

The multitude of DoD Agencies, computer systems, and internal procedures to process contract payments and properly account for them presents a formidable challenge when trying to unravel the process and present it as a pay/accounting flow chart. The objective of this section will be to do just that, to follow an invoice from submission to payment and to see what happens with the disbursing and accounting data. To do a proper study of DoD's EFT and contract payment initiatives, one should begin with an understanding of how the payment and accounting cycle works. To analyze the impact of EFT without understanding the payment process would be incomplete.

Before identifying the key components of the DoD pay and accounting cycle, it is helpful to outline the process by using a "conceptual" pay and accounting cycle. Figure 7 outlines the process by which a typical invoice may be processed, regardless of the actual organizations and computer systems involved. What can be observed from the conceptual model is the dependency of each step on the other steps in the cycle. For a payment to be processed correctly, each step must be performed correctly. If not, the errors of one activity will flow through the process, requiring rework at some point in the process. It is with this thought in mind that each DoD activity in the process will be briefly discussed, as well as their role in the pay/accounting cycle, and the system(s) which they use to perform their role. After reviewing



A Typical Transaction:

Step 1. Contract awarded, sent to contractor.

Step 2. Material Sent to Receiving Activity.

Step 3. Invoice sent to Paying Office.

Step 4. Receiving Activity sends Receipt notice to Paying Office.

Step 5. Invoice processed for payment, data entered onto disbursing system.

Step 6. Contractor payment sent.

Step 7. Accounting System updated.

Step 8. Disbursing/Balance Sheet data submitted to Treasurer.

Step 9. Data provided to Buying Office.

Figure 7: A Conceptual Payment/Accounting Cycle

the components separately, they will be consolidated into a flow chart diagramming the entire pay/accounting cycle.

2. Defense Management Review Decision (DMRD) 910.

Before beginning the pay/accounting cycle review, it is necessary to briefly describe the impact that Defense Management Review Decision (DMRD) 910 has had on the process. On October 1, 1992, when DMRD 910, "Consolidation of DoD Accounting and Finance Operations" took effect, the Defense Finance and Accounting Service (DFAS) was tasked with standardizing and consolidating finance and accounting applications throughout DoD. Six centers were established (including DFAS-Columbus Center), with Washington, D.C. as Headquarters [Ref. 5: p. 5]. Of the six centers, DFAS-Columbus Center was tasked as the primary contract payment site [Ref. 41: p. XI-6]. The impact of the contract payment consolidation is being felt at many of the Authorization Accounting Activities (AAA's), since many of them perform their own contract payments. The consolidation effort has raised many issues and concerns, which will be addressed in Chapters IV and V. For the purpose of the discussion on the pay/accounting cycle, DFAS-Columbus Center will be the paying office to be reviewed.

3. The Buying Office: Aviation Supply Office, Philadelphia.

Aviation Supply Office (ASO) Philadelphia is the primary buying and inventory control office for Naval aviation repairable and consumable materials. As the aviation Inventory Control Point (ICP), ASO manages over 156 thousand consumable line items and over 83 thousand repairable line items [Ref. 42]. In fiscal year 1992, ASO awarded in

excess of $1.36 billion in contracts ($1.28 billion large purchase, and $.08 billion small purchase), representing 32,697 contract actions (5,471 large purchase, and 27,226 small purchase) [Ref. 42].

Besides its role as a buying activity, ASO is also an Authorization Accounting Activity (AAA) and, until recently, performed its own disbursement function. ASO currently uses its own "proprietary" accounting/disbursing system called the Integrated Disbursing and Accounting (IDA) process (also referred to as "G06") [Ref. 43]. The disbursing function at ASO has now been eliminated, except for some older contracts on the IDA system. New contracts have a DFAS site as their designated payment office. As of December 31, 1992, there were 6,536 contracts totaling $1.628 billion still on the G06 system, which were ASO's responsibility for payment [Ref. 44]. Since the disbursing operation has shut down, ASO uses the Naval Supply Center, Charleston as its disbursing office as it continues to close out the remaining contracts [Ref. 45].

As an accounting/payment system, the IDA system provides ASO with useful inventory information (including units shipped, pay status, etc.), down to the contract line item (CLIN) and destination (SUBCLIN) [Ref. 45]. As such, ASO has been able to identify for inventory control purposes what line items are being paid for under what invoice. As a Buying office and ICP, the accounting and inventory management functions are closely intertwined [Ref. 45]. ASO routinely extracts data from its payment/accounting system to support its inventory management functions. As will be discussed in Chapters IV and V, ASO is experiencing

difficulty in obtaining the inventory related information it feels is necessary from the payment system at DFAS-Columbus Center's, the Mechanization of Contract Administrative Services (MOCAS) system.

4. The Role of the Contractor.

While it may seem obvious, the contractor plays a vital role in the pay/accounting cycle. The contractor must abide by the terms of the contract, the Federal Acquisition Regulation (FAR), and the DoD Federal Acquisition Regulation Supplement (DFARS). Proper preparation and distribution of the DD 250, Material and Inspection Report (which is authorized for use as an invoice and detailed in Appendix F of the DFARS [Ref. 46: App. F]). There is a useful guide, Contract Payment Information, distributed by DFAS-Columbus Center which provides DD 250 and invoice preparation guidance beyond that provided for in the DFARS [Ref. 47]. Even with the guidance available, the Federal Regulations and Contract requirements can be complex, so contractors do make errors in invoice submission. The DFAS-Columbus Center guide outlines the most common errors, as follows:

- Failure to properly distribute the DD Form 250.
- Preparation errors on DD Form 250.
- Preparation errors on invoice [contractor's own invoice in lieu of the DD Form 250].
- Extraneous documents sent to payment office with invoice.
- Including multiple shipments on a single commercial invoice.

[Ref. 47: p. 11]

Once the invoice is submitted correctly, the contractor needs information from the payment office to determine when it will receive payment. As stated in the introduction, some businesses depend upon their DoD contract payments for their day-to-day survival. Others need payment information as part of their cash management strategy. The mechanism(s) by which DFAS-Columbus Center provides information will be discussed later in this section.

5. The Role of the Receiving Activity.

The receiving activity plays a small but vital role in the overall pay/accounting cycle. Without an acknowledgement of receipt, the invoice will not be paid. Receipt takes two general forms. "Free-on-board" (FOB) "destination" shipments are received by the activity where the material is shipped. For FOB "source" shipments, the material is accepted at the contractor's plant before shipment, typically by a Quality Assurance Representative (QAR) or some other authorized Government representative. For the FOB source shipment, it is the acceptance at the plant that is necessary for invoice payment.

The receipt date also determines when any contractor discount period begins, and it starts the "Prompt Payment" time period. Prompt Payment refers to Public Law (PL) 97-177, Prompt Payment Act of 1982 and PL 100-496, the Prompt Payment Act Amendment of 1988. The Prompt Payment Act requires the Government to pay interest on invoices if they are not paid in a timely manner [Ref. 47: p. 9]. It is the receiving (or acceptance for FOB source) signature that initiates the start of the time period for the Government to process and pay the invoice.

6. DFAS-Columbus Center: The Role of the Paying Office.

a. Overview of DFAS.

The Defense Finance and Accounting Service-Columbus Center is one of six DoD finance centers which evolved from the DMRD 910 consolidation effort. Table 1 identifies each the DFAS sites and their respective areas of support. Through the consolidation effort there have been many DoD payment sites which have been discontinued, and others which are still in the process of being consolidated. The actual consolidation effort is not a concern of this study, except to say that it is still in progress.

TABLE 1

DFAS CENTERS AFTER DMRD 910

DFAS Center Site	Area of Responsibility
DFAS Washington, D.C.	Headquarters
DFAS Columbus Center	DLA/Contract Payments
DFAS Indianapolis	U.S. Army
DFAS Kansas City	U.S. Marine Corps
DFAS Denver	U.S. Air Force
DFAS Cleveland	U.S. Navy

b. Overview of DFAS-Columbus Center.

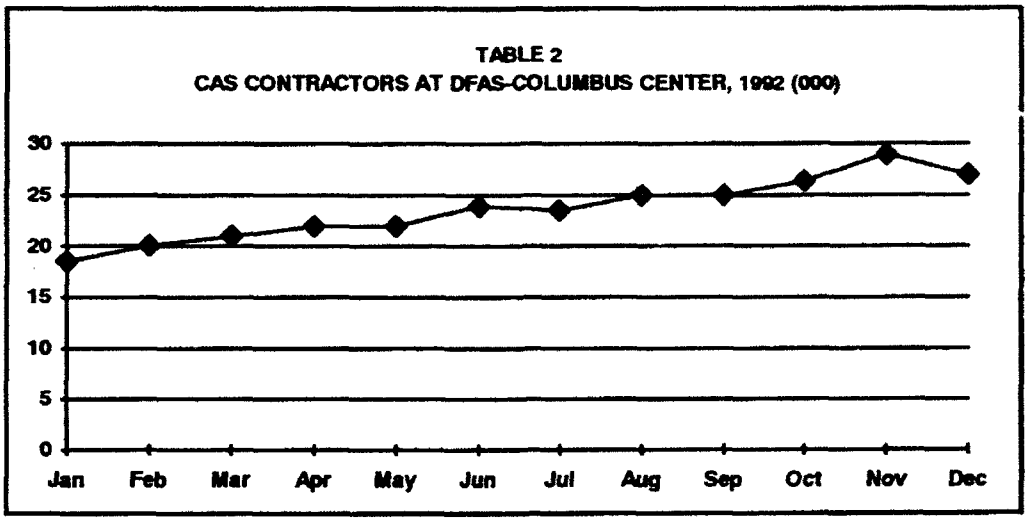
The DFAS-Columbus Center and its payment capabilities will be a key focal point for the remainder of this study. DFAS-Columbus Center identifies its contract payment section as Contract

Administration Services (CAS). The CAS is divided into five regional directorates (Northeast, Mid-Atlantic, Central, South, and West) [Ref. 48: p. 2-2]. DFAS-Columbus Center is involved in much more than contract payments, as its mission statement reveals:

> Our Mission: To provide for the implementation of policy related to financial management including accounting, certification, and disbursing operations for contract administration services, stock fund, general accounting, civilian payroll, and travel services. [Ref. 49]

Of particular note in the mission statement is the Stock Fund payments function at DFAS-Columbus Center. Stock Fund payments involve revolving account (i.e., non expiring) funds, and are generally more routine in nature than the CAS contracts, which use appropriated (expiring) funds. Stock Fund payments are made using the Standard Automated Material Management System (SAMMS), a computer system distinct from the MOCAS system. The SAMMS system is beyond the scope of this study, however the distinction between stock fund and contract payments is important.

The CAS payment role at DFAS-Columbus Center has undergone substantial growth as the consolidation effort continues. As Table 2 indicates, there has been a steady growth in the number of contractors paid out of DFAS-Columbus Center.

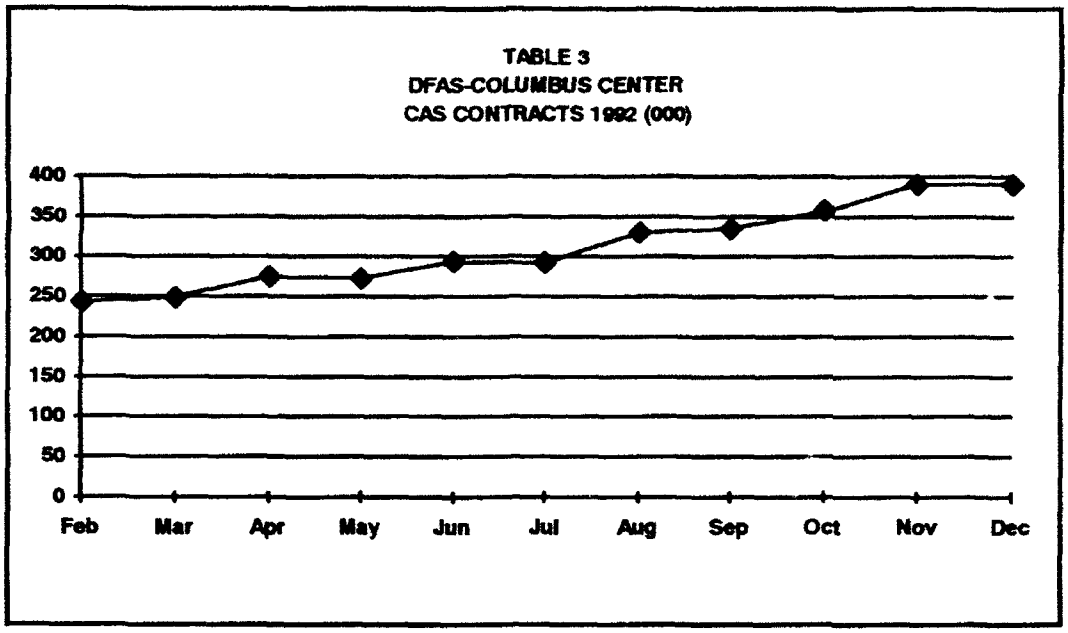


[Ref. 50]

The rapid growth of the DFAS-Columbus Center payment function was expected, as the following passage indicates:

> As a result of DLA's efforts to consolidate payment functions, DFAS-CO's [DFAS-Columbus Center] workload is projected to increase substantially. DFAS-CO expects the number of contractual documents processed by the five CAS Payments Directorates to increase from the current annual volume of 180,000 to 460,000 (worth an estimated $100 billion) by 1993. Even greater growth is projected for the number of invoices processed by the CAS Payments and Stock Fund Directorates - in excess of 400 percent. [Ref. 48: p. 2-4]

Table 3 confirms the steady growth in the number of contracts paid out of DFAS-Columbus Center.



[Ref. 50]

c. The MOCAS System at DFAS-Columbus Center.

The MOCAS system is described as follows:

> ...[An] internal system designed by the Defense Logistics Agency (DLA) to implement and respond to MILSCAP [Military Standard Contract Administration Procedures]. It is an automated data system which provides line management and operational data on delivery schedules, shipments, contractual changes, and disbursements to contractors. [Ref. 51: p. 2]

The MILSCAP format contains selected contract data elements in an 80-column format which permits the MOCAS system (and other DoD systems) to interface with other DoD activities [Ref. 52: p. 2-14]. MOCAS performs post award contract administrative, accounting, and payment functions. It is a mainframe, batch processing system utilized by DFAS-Columbus Center for invoice processing, payment, and reporting [Ref. 48: App. B-1,2; Ref. 50]. Each of the five CAS directorates has its own separate

MOCAS database. Separating the databases may create some administrative delay in processing documents, as will be examined in Chapter IV.

The electronic payment function at DFAS-Columbus Center is an add-on module to MOCAS, developed in-house [Ref. 50]. It will be discussed later. MOCAS is menu driven, and provides many data query capabilities for its users. One limitation to MOCAS data queries is that the user cannot perform a query by stock number, only by contract or shipment number [Ref. 53]. This can be a problem for MOCAS users such as ASO Philadelphia.

d. Contractor Information Services at DFAS-Columbus Center.

As stated earlier, once the invoice is submitted, the contractor needs follow-up capabilities. DFAS-Columbus Center provides three information services: Electronic Bulletin Board (EBB), an 800 number telephone service, and the Contractor Inquiry System (COINS) [Ref. 50]. These systems provide contractors with limited invoice status information. The COINS system, a PC based system that the contractor can tie into via a modem, offers some unique query capabilities. Contractors can call up COINS, extract payment data by contract number or by payment due date, and download the information to their own system [Ref. 54]. Payment information by due date can be especially valuable to a treasurer/comptroller for cash managment purposes. The COINS system and others will be evaluated in Chapter IV.

e. DFAS-Columbus Center's Role in the Payment/Accounting Cycle.

As the paying office DFAS-Columbus Center is ultimately responsible for payment of the contractor. To perform its mission, DFAS-Columbus requires (1) a proper invoice from the contractor; (2) receipt acknowledgement (or acceptance); (3) current contract information, such as modifications, amendments, etc.; (4) if an electronic payment is to be made, an agreement with the contractor (referred to as a Trading Partner Agreement, or TPA) identifying the proper banking related information; and (6) sufficient funds in the appropriation to pay the invoice. Depending on the type of contract, there may be other requirements as well, such as Defense Contract Audit Agency (DCAA) approval for cost reimbursement vouchers on cost-type contracts.

Once DFAS-Columbus Center has this information, it is responsible for making payment in a timely manner in accordance with the Prompt Payment Act, and reporting the payment to an appropriate accounting and/or disbursing system. DFAS-Columbus Center needs complete, accurate information to perform its mission. Without it, the payment cycle can abruptly halt.

7. The Disbursing System: The Navy's Financial Reporting System.

Once the MOCAS system at DFAS-Columbus Center has made the payment, the pay related data (i.e., payment amount, appropriation charged, contract, etc.) must be reported so that the expenditure is registered against the proper appropriation. The Navy's Financial

Reporting System (FRS) is the consolidation point for all Navy disbursements. The FRS operates at various sites (San Diego, Norfolk, Jacksonville, Naval Training Center Great Lakes, and Pensacola) using the UNIVAC 1100 system [Ref. 55] The FRS collects the daily disbursement data from Navy and DoD payment sites, such as DFAS-Columbus Center. This information is reported to the FRS by the various accounting/payment systems issuing Navy payments, such as MOCAS. The FRS system generates a daily disbursing report, the NAVCOMPT 634, which is sent to the Authorization Accounting Activity (AAA). This is the first indication that the AAA has that a payment has been made against one of its appropriations [Ref. 56]. The FRS verifies the payment and accounting data, performing an edit function referred to as the Centralized Master Edit Table (CMET) [Ref. 56]. Errors in accounting data (i.e., wrong appropriation number, subheading, etc.) are caught by the CMET process. These errors are referred to as "undistributed disbursements" (payments made but not properly distributed) [Ref. 56] These undistributed disbursements are sent to the AAA as a suspense report, for correction. As these reports are reviewed and corrected by the AAA, they are returned to the FRS using the NAVCOMPT 621, Suspense Report Corrections. The NAVCOMPT 621 corrections are processed by the FRS; however, the corrections do not post to the AAA's computer system until a monthly data download from another system, the Navy's Centralized Expenditure/Reimbursement Processing System (CERPS) is processed [Ref. 56]. On a weekly basis the FRS accumulates the daily disbursements, balances its books, and transmits the data to the next

higher level, the Navy's CERPS system. The CERPS system will be discussed later in this section.

A point needs to be made regarding the CMET function. Presently the CMET function is not performed until after payment has been made, thus permitting erroneous accounting data to be cited on payments. This process is being changed, with the CMET function to be conducted before payment [Ref. 57].

To summarize the role of the FRS disbursing system, it (1) consolidates all Navy disbursements on a daily basis; (2) performs an audit on the appropriation data charged; (3) reports disbursement errors and makes corrections; and (4) reports Navy disbursements to the next higher level. Error correction plays a significant part in the FRS process.

8. The Role of the Accounting System.

The main point to make about accounting systems in DoD is that there are a lot of them, and they all perform similar functions. Many have disbursing functions (such as the G06 system at Philadephia), and many were developed as stand-alone systems. With the consolidation of payment functions under DFAS, it is now necessary for these unique systems to communicate. This will be discussed further in Chapters IV and V. For now, suffice it to say that accounting systems perform at a minimum the following functions: matching disbursements to the proper appropriated account (referred to as obligations); maintaining local accounting records; reporting functions; and data query functions. Two accounting systems will be discussed briefly here, the Navy's Standard

Accounting and Reporting System (STARS), and the Air Forces Acquisition Management Information System (AMIS).

a. The Navy's Standard Accounting and Reporting System (STARS).

The STARS system is the Navy's principal accounting, reporting, and payment system [Ref. 58: preface]. STARS performs two major functions, invoice payment (disbursement function) and the accounting function [Ref. 56]. The STARS system was formerly under the control of the Navy Regional Finance Center, Washington, D.C., however since the financial consolidation effort, DFAS-Cleveland now manages the system.

Disbursements from the STARS system utilize the CMET process to identify undistributed disbursements. As with any AAA activity, DFAS-Cleveland must correct these errors. Undistributed disbursement correction is a difficult, labor intensive process for the AAA [Ref. 45], and appears to be a "systemic" problem throughout the payment/accounting cycle.

The STARS system has an electronic payment module, called the STARS Electronic Processing System (SEPS). The SEPS system is essentially an add-on module to STARS, developed under contract with EDI Integration Corporation (EIC) [Ref. 58]. The SEPS system provides a comprehensive electronic payment system approach, as compared to some less aggressive approaches being taken by other activities. SEPS is one of the electronic payment systems to be discussed in greater detail later in this chapter.

b. The Acquisition Management Information System (AMIS).

(1) AMIS System Overview. The AMIS system is the U.S. Air Force's "all-in-one" integrated contracting system for U.S.A.F. weapon systems, subsystems, and research and development [Ref. 59: p. 4-9]. The Air Force defines the purpose of AMIS as follows:

- Establish a uniform contract data system that provides for the most economical use of resources and ensures the timely flow of information to systems users.
- Reduce the flow of hard-copy documents within AFSC [Air Force Systems Command].
- Provide full MILSCAP capability for AFSC so that AFSC can exchange contract data with DCAS [now Defense Contract Management Command, DCMC] and the other services.
- Support the disbursement function at [formerly] Air Force Contract Management Division [now consolidated under DCMC]. [Ref. 52: p. 2-1]

As an "all-in-one" system, AMIS has four subsystems, (1) Procurement Management, (2) Price History, (3) Distributed Processing for Contractual Input, and (4) Contract Administration (including payments) [Ref. 59: Table 4-5]. The AMIS system operates on one mainframe computer system at Wright-Patterson Air Force Base in Ohio, and is well suited to high volume, batch processing functions.

(2) The AMIS/MOCAS Merger. Functional testing is currently being conducted on conversion programs which will transfer the contract payments function within AMIS to MOCAS. Testing began in March 1993, with a goal of October 1993 for full implementation [Ref. 60]. While the AMIS payment function is being eliminated, the contract administration and accounting functions will remain in place

indefinitely. It will be up to the newly consolidated Air Force Material Command (AFMC) to determine the future uses for AMIS [Ref. 60].

One of the key problems being worked out with the AMIS/MOCAS merger is that AMIS only recognizes USAF appropriation data, whereas MOCAS recognizes all DoD appropriations. This could create problems in transmitting payment data from the MOCAS "payment" system to the AMIS "accounting" system [Ref. 60]. Another concern is the rigidity of MOCAS with regard to data entry. Strict, standardized data elements are necessary for MOCAS to accept information. Unless the AMIS data matches the MOCAS format exactly, MOCAS will reject the data. There is the potential that the data entry clerk may "manipulate" the entry data to make it "fit" the MOCAS format. This can lead to expenditures not matching up with obligations after payment has been made (i.e., undistributed disbursements). The AMIS/MOCAS merger should provide an excellent study for future consolidation efforts, and the potiential problems that can be experienced.

c. Summarizing the Accounting System's Role.

Each of the systems identified thus far (IDA, MOCAS, STARS, AMIS) has performed both accounting and disbursing functions. Regardless of the system, the accounting systems all perform essentially the same function for the AAA, matching expenditures to the proper appropriation, updating the accounting ledgers, data queries, and reporting. If an error is made in assigning the correct appropriation data to the payment, the accounting process can stop dead in its tracks (undistributed disbursement) until it is cleared up, typically through a

labor intensive review effort. From the accounting perspective, one of the most important requirements of the accounting system in the cycle is proper data entry at each previous step in the process. This issue will be considered further in Chapters IV and V.

9. The Reporting Process to the U.S. Treasury.

The Navy's Centralized Expenditure/Reimbursement Processing System (CERPS) is the final system in the payment/accounting cycle. CERPS acts as a "clearing house for Navy level accounting distribution transactions" [Ref. 61]. The CERPS system takes the Navy's consolidated disbursements, combines them with other DoD and non-DoD disbursements made against Navy appropriations, referred to as "cross disbursements" [Ref. 61], and reports this monthly to the U.S. Treasury's Financial Management Service as the Navy's Statement of Accountability. In addition, CERPS provides a monthly download to the AAA's, updating their accounting data and posting the corrections to the undistributed disbursements that the AAA had resubmitted through the FRS. The monthly download will also generate a new undistributed disbursement report at the AAA, which starts the reconcilation process all over again. The CERPS generated Statement of Accountability must match the sum of the individual disbursing office Statements of Accountability (balance sheets), DD Form 1219, submitted separately to the U.S. Treasury each month.

10. The Payment/Accounting Cycle Flow Chart.

The steps just reviewed have been consolidated to produce the flow chart in Appendix C, which follows the payment and accounting steps

of a typical Navy invoice. One point to be made is that the accounting system (STARS) and payment office (DFAS-Columbus Center) selected in the chart could easily be replaced in the flow chart by another accounting or another payment activity. The process remains essentially the same.

The EFT/Financial EDI portion of the payment/accounting cycle makes up only one step in the entire process. Once a payment is made, the process does not end until the expenditure and obligation match up exactly, allowing the transaction to be closed out and reported. To reiterate an observation made at the outset of this section, any error in one of the steps in the pay/accounting cycle will impact the other steps, slowing or stopping the process.

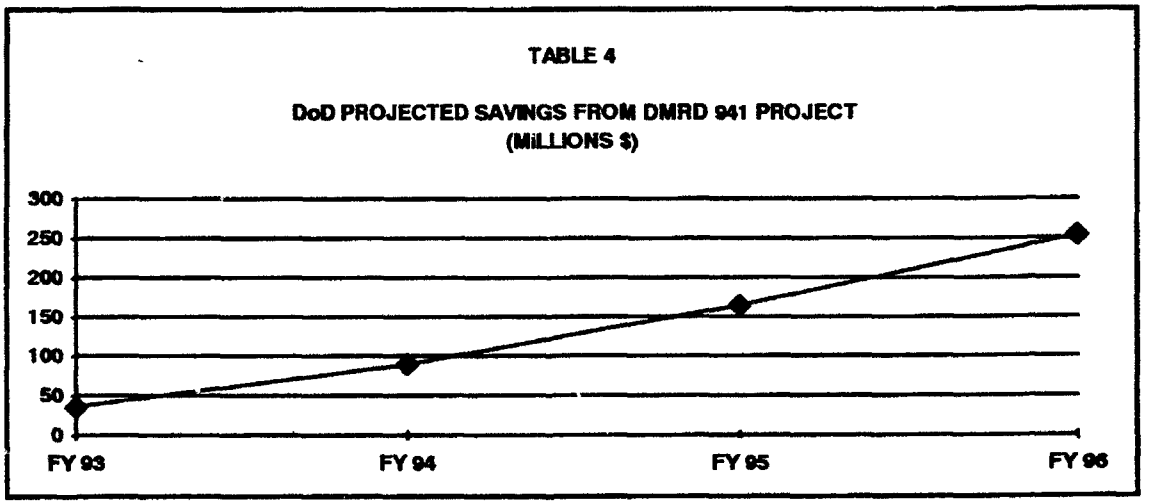
With the payment/accounting cycle identified, those steps in the process that are being automated through EFT and Financial EDI will next be discussed, along with an overview of DoD's Electronic Commerce Program.

E. ELECTRONIC PAYMENT/EDI INITIATIVES UNDER DoD's ELECTRONIC COMMERCE PROGRAM.

1. History of Electronic Commerce Within DoD.

The Department of Defense has been a very active proponent of electronic payment and EDI initiatives. This effort began in May 1988 when Deputy Secretary of Defense Taft directed DoD to "...make maximum use of electronic data interchange (EDI) for the paperless processing of all business-related transactions" [Ref. 3: p. 1-1]. As stated in the introductory chapter, in May 1990, the Assistant Secretary of Defense

(Production and Logistics) designated the Defense Logistics Agency (DLA) as the Executive Agent for EDI [Ref. 4: para. 1.3]. The DLA Executive Agent contracted with the Logistics Management Institute (LMI) to prepare a plan for the EDI initiative [Ref. 3]. The subsequent report identified 16 high-usage DoD documents as prime candidates for conversion to EDI [Ref. 3: p. 2-3]. The LMI report projected $1.17 billion (direct and indirect) life cycle cost savings, from an initial investment of $79 million by converting the 16 documents to EDI [Ref. 3.: Table 2-9]. With the LMI report as a foundation, Defense Management Review Decision (DMRD) 941, issued in November 1990, directed the conversion of the 16 documents to EDI. Table 4 below provides the projected savings over the next three fiscal years from implementation of the DMRD 941 project.



[Ref. 62]

The DLA EDI Executive Agent office believes that the DMRD 941 project can be accomplished under budgeted cost [Ref. 63].

"Electronic Commerce" is the title given to DoD's goal for conversion to EDI (including Financial EDI and EFT initiatives). Electronic Commerce is defined by DLA as the "end-to-end paperless exchange of routine business transactions" [Ref. 62]. The commitment to the Electronic Commerce program is well stated in the DLA EDI Executive Agent information package, A Partnership with Industry, as follows:

> DoD is dedicated to creating an electronic (paperless) environment for conducting commerce and achieving significant gains in quality, responsiveness, and savings afforded by such an environment.
>
> Electronic Data Interchange (EDI) is essential to our plans for streamlining corporate information management, extending total quality management, maintaining prompt payment, and more effectively utilizing our commercial base in support of Defense goals. By standardizing and automating the exchange of business transactions from pre-award through final delivery and payment, EDI *opens the door to electronic commerce* (EC). [Ref. 64]

The EDI standards adopted by DoD are the ANSI X.12 standards. [Ref. 4: para 10.1] The Electronic Commerce Program encompasses a wide range of EDI projects involving many applications, systems, and agencies throughout DoD. The role of the EDI/EC Executive Agent, the objectives of the Electronic Commerce Program, and a summary of the electronic payment/EDI projects underway within DoD will be reviewed.

2. The Role of the DLA EDI/EC Executive Agent.

To generalize the role of the DLA EDI/EC Executive Agent, its purpose is to guide the DoD EDI implementation process towards an ultimate goal of complete systems integration, thus providing a "single [DoD] face to industry" [Ref. 62]. As an "enabling technology" [Ref.

63], EDI can support a command as it makes improvements in its business processes. The Executive Agent supports that command by identifying the EDI tools available to work with (EDI standards and conventions), as well as specific guidance on EDI implementation. The Executive Agent does not get involved with the command's internal decisions regarding its business processes [Ref. 63]. To better clarify the role of the Executive Agent, the following paragraphs summarize some of its responsibilities.

a. DoD Implementation Guidelines.

The Executive Agent is responsible for the development and issuance of the DoD Implementation Guidelines for Electronic Data Interchange (EDI). These guidelines provide:

> ...general guidance on the implementation of American National Standards Institute (ANSI) Accredited Standards Committee (ASC) X12 electronic data interchange (EDI) standards within automated information systems (AIS) and information exchange procedures that require the collection, reporting, and/or exchange of data needed to perform Defense missions. [Ref. 4: para. 1.1]

More simply put, the Guidelines provide DoD agencies that are beginning to use EDI with information on what the DoD standards are, and how to get started. Once an agency has decided to implement EDI, it is on its own to carry out the project. It is the DoD Agencies' responsibility to comply with the Guidelines; it is not the Executive Agent's role to enforce them. The Guidelines are in two volumes. Volume I provides functional and technical background information and offers guidance for implementing EDI. Volume II provides the EDI standards (i.e., ANSI X.12 transaction set formats) and conventions (i.e., common practices for use

of the standards) authorized for use within DoD [Ref. 4: para. 1.5]. An important part of the Executive Agent's role is to authorize use of the EDI standards and update the conventions to be used within DoD.

There is limited DoD guidance for electronic funds transfer. Section 7.5 and 10.7.4 of the Guidelines provide basic EFT background information (Vendor Express, ACH network) and the EDI standard and convention for the ANSI 820 (payment order/ remittance advice), respectively. These sections are purely informative, not imposing any special restrictions on EFT use [Ref. 4: paras. 7.5, 10.7.4].

It is important to point out that, while the DoD EDI Implementation Guidelines provide the background and technical information necessary to implement EFT, it is the Federal Acquisition Regulations (FAR) that requires an EFT clause be included in any Government contract authorizing EFT payments [Ref 65: part 52.232-28].

b. EDI Pilot Projects.

With the investment funds provided for under DMRD 941, the Executive Agent has provided "seed" money for new EDI projects in DoD. There are restrictions, as follows:

> The Executive Agent provides the overall systems architecture for the Department of Defense, how the components implement that specific architecture is totally up to the respective component/agency. The Executive Agent will only fund those projects which are in compliance with the Standards Architecture. [Ref. 63]

c. EDI Training.

The Executive Agent is active in promoting DoD's Electronic Commerce program at Trade shows, conferences, etc. The Executive

Agent's small business training program, Productivity Enhancement Training (PET), provides small businesses with a two day training seminar on EDI and DoD's Electronic Commerce program [Ref. 66]. The PET training seminars are conducted on a request basis, contingent upon available funding and cost sharing with the host site [Ref. 67]. Educating DoD activities on EDI is another "function" of the Executive Agent. "EDI viewed as a technology, not a methodology" [Ref. 68] within DoD provides a major hurdle in getting DoD activities up to speed on the capabilities of EDI.

d. Standardized System Architecture.

Critical to the success of the Electronic Commerce Program is achieving standardization across all EDI capable DoD Agencies. This is a challenge for the Executive Agent, considering the variety of systems in DoD and applications they perform. Through standardization,

> The end result is horizontal integration of applications within DoD, a single face to private industry, and greatly enhanced efficiency and effectiveness of DoD applications.
>
> [Ref 4: para 4.1]

To integrate the different systems, Intelligent Gateway Processors (IGP's), "a combination of hardware and software designed for transparent, 'intelligent' connectivity to heterogeneous computers" will be used [Ref. 4: para 4.1.2]. Although the technical aspects of IGP's is beyond the scope of this study, the benefit is clear:

> The value added by the intelligent gateway processor is that it mediates more than the physical connection between machines: it goes into the other systems and extracts the needed data for the user without the user's needing to know how to use that computer or that computer's application programs. In addition, the IGP is designed to transparently link various types of telecommunications options with a single machine. [Ref. 4: para 4.1.2]

As the electronic payment functions within DoD are consolidated and the activities involved in the payment/accounting cycle become more EDI capable, the standardization and communication requirements identified above will become a necessity.

e. The EDI "Hub" Concept.

One of the major initiatives underway under the Executive Agent's cognizance is the establishment of EDI "Hubs". An EDI Hub will act in much the same way as a clearing house for EDI transmissions throughout DoD. One of the objectives of the "Hub" concept is to prove that the standardization and communication capabilities identified above actually work. There are four DoD sites identified as EDI Hub sites: ASO Philadelphia (Navy); DAASO Dayton, Ohio; McClellan AFB, Sacramento CA.; and Kelly AFB, San Antonio, Texas [Ref. 69]. The Hub concept is providing an opportunity for DoD to test translator system architecture, such as the Navy's Risc 6000 system (ASO Philadelphia) and the Air Force's GATEC (Government Acquisition Through Electronic Commerce) system [Refs. 69, 70]. Testing of the Hub concept was successfully conducted in March 1993 at ASO Philadelphia. Testing at the Defense Automated Address System Office (DAASO), Dayton, Ohio is scheduled for early June 1993 [Ref. 71].

f. Summary of DLA EDI/EC Executive Agent's Role.

The EDI/EC Executive Agent Office is the primary coordinator for EDI implementation in DoD. Its mission is to carry out the directives of DMRD 941, to convert DoD to a "paperless environment". The Executive Agent deals with both the policy and technical EDI issues, such as ensuring that the standardized system architecture and communication protocols specified in the DoD EDI Guidelines are met. Training, pilot project support, and new initiatives such as the EDI Hub concept fall under the Executive Agent's functions as well.

3. The Navy's EDI Program.

The Navy's EDI Project Managment Office (PMO), under the direction of Donna Felix, the Navy's EDI Program Manager, has been described as taking a "maverick approach" to EDI implementation [Ref. 70]. The Navy approach appears to be well-orchestrated, utilizing existing computer technology and communications networks for implementing EDI [Ref. 72]. "Foot-dragging" is certainly not part of the Navy's plan. Donna Felix describes the Navy's EDI program as follows:

> A multi-year budget provides for investment in hardware, operations, maintenance, systems development, and process engineering, and we're making a coordinated and logical approach to use these funds. We're reducing acquisition costs by Navy-wide procurement of hardware, software and training. This allows us to share translators across the Navy Logistics Network [data communications network]. Central coordination of all activities minimizes redundancy, ensures adherence to ANSI/DoD standards, and makes one organization responsible for reviewing progress and reporting. In addition, investments are prioritized to seed high-payoff opportunities.
>
> Our EDI penetration target starts at eight percent in 1992 and builds to 95 percent penetration by 1997. [Ref. 73: pp. 22-23]

The Navy's aggressive approach to EDI is in part fueled by budgetary cuts, personnel cuts, and the need to achieve cost savings in a relatively short time [Ref. 73: p. 22].

a. "Off-The-Shelf" Technology.

Among the factors which appear to set the Navy apart from other EDI implementation activities is the use of existing commercial EDI capable hardware and software. Federal Data Corporation provides technical, training, and installation support for the Navy's EDI translation sites (Navy EDI connecting platforms), using the IBM Risc 6000 minicomputer and American Business Computer (ABC) EXCEL translation software [Refs. 70, 74 pp. 3-1,2]. VEDA, Inc., offers consulting services at the NAVSUP PMO level [Ref. 70]. The STARS/SEPS project, which was formerly under NAVSUP (now a DFAS-Cleveland project as part of the DMRD 910 consolidation), was contracted out to EDI Integration Corporation (EIC) for "technical coordination for design, development, implementation and support of the SEPS program systems." [Ref. 58: p. 6] This reliance on existing commercial technical support is a different approach from some other DoD activities, which have been developing much of their EDI capabilities in house. While it is too early to measure the overall success of most EDI projects, a cost/benefit comparison between contracting out and in-house development of EDI functions may help with future EDI project decisions.

b. The Navy's Strategic Plan.

The Navy's EDI program falls under the control of the Naval Supply Systems Command (NAVSUP) [Ref. 74]. The framework for the Navy's

EDI program is outlined in NAVSUP's Strategic Plan For Electronic Data Interchange [Ref. 74]. The Navy's Strategic Plan is written to complement the DoD EDI Guidelines, to "...tailor DLA's broad directives and policies to its [Navy's] own mission and business situations." [Ref. 74: p. 1-1]. The Navy's Strategic Plan is structured in a Total Quality Management (TQM) format, identifying broad guiding principles down to specific strategies and tactics for the Program Manager to implement. Two of the guiding principles are listed below:

- We will reduce the cost of operations, improve quality, and increase productivity by removing non-value-added-business processes and information exchanges. EC [Electronic Commerce] requires not only the automation of paper but a fundamental change in business operations to eliminate redundant and obsolete processes.

- We will focus initially on high-payoff opportunities to impr ve competence with EDI and build morale with project successes. We will start by automating high-volume, paper-based transactions with EDI-capable trading partners. [Ref. 74: p. 4-1]

The Navy's Strategic Plan spells out clearly and concisely what the Navy intends to accomplish with EDI, and sets milestone dates for their completion [Ref. 74: pp. 5-1,2]. It provides the Navy's EDI Program Manager with the authority and direction to achieve the Navy's goals. It is a good model for other DoD activities to emulate.

c. Current Navy EDI Projects.

The Navy EDI PMO oversees a wide range of activities and EDI projects, among them those at ASO Philadelphia, which will be discussed later in this section. Regarding EFT and Financial EDI projects, the Navy is no longer in the electronic payment business since the

consolidation of payment functions under DFAS. The STARS/SEPS project, originally a Navy project, will be reviewed in the next section. The Navy EDI PMO has numerous projects in progress, many of which are to test different EDI transaction sets on Navy purchasing systems [Ref. 74: pp. 3-2 through 3-8]. One Navy-wide project is to establish EDI translator sites. The EDI translator project using the IBM Risc 6000 computer, "provides the connectivity" [Ref. 72] for the Navy's EDI systems, and is the focus of much of the PMO's attention. At selected Navy installations (supply centers, purchasing offices, etc.), the translator systems (IBM Risc 6000 minicomputers running ABC EXCEL software) link the Navy EDI sites through the Navy Logistics Network (NLN), thus providing the framework for a Navy Network [Refs. 70 & 72]. By linking the Navy translator sites to other DoD EDI systems, this can help achieve DoD's overall "...horizontal integration of applications within DoD" [Ref. 4: para 4.1].

As with its Financial EDI/EFT projects, the Navy EDI PMO relinquished control of the Risc 6000 translators as of April 15, 1993, as part of a consolidation effort under DISA (the DoD information systems command) [Ref. 72]. With the physical control of the translators changing hands, the budgetary control for the Navy's EDI translators likewise is consolidated under DISA. With the funding provided under DMRD 941 drying up, identifying financial supporters for future Navy EDI ventures will occupy more of the PMO's time in the future [Ref. 72].

4. The STARS Electronic Processing System (SEPS).

a. Background.

The SEPS project provides a unique approach to electronic payment systems being implemented in DoD, in that it offers a comprehensive EDI payment package for contractor and DoD activity alike. Figure 8 provides a flowchart of the SEPS concept. It has been a main focal point of this study, and will be discussed in detail. As stated earlier, the SEPS project was initiated under NAVSUP as an electronic payment module for the STARS system. With the DMRD 910 consolidation effort, the STARS system (and SEPS project) were capitalized under DFAS-Cleveland. The EDI Integration Corporation (EIC) has been the prime contractor for SEPS implementation.

b. SEPS System Characteristics.

The SEPS program was initiated with the following objective:

> To improve accuracy within STARS, abbreviate the time required for various activities, reduce the volume of paper documents, and eliminate as much as possible through the use of Electronic Data Interchange (EDI) Standards. [Ref. 75]

Contractors participating in the SEPS program can be paid using a variety of electronic payment choices. Contractors may choose a Vendor Express (ACH network) format, or may choose a Financial EDI format (ANSI 820) [Ref. 58: p. 22]. Since payment is made via the Federal Reserve Bank (for STARS payments, FRB Richmond is the supporting bank), the ANSI 820 transaction cannot be processed directly, so it will be incorporated into the CTX application format. Figure 9 shows the Financial EDI/EFT payment process using SEPS.

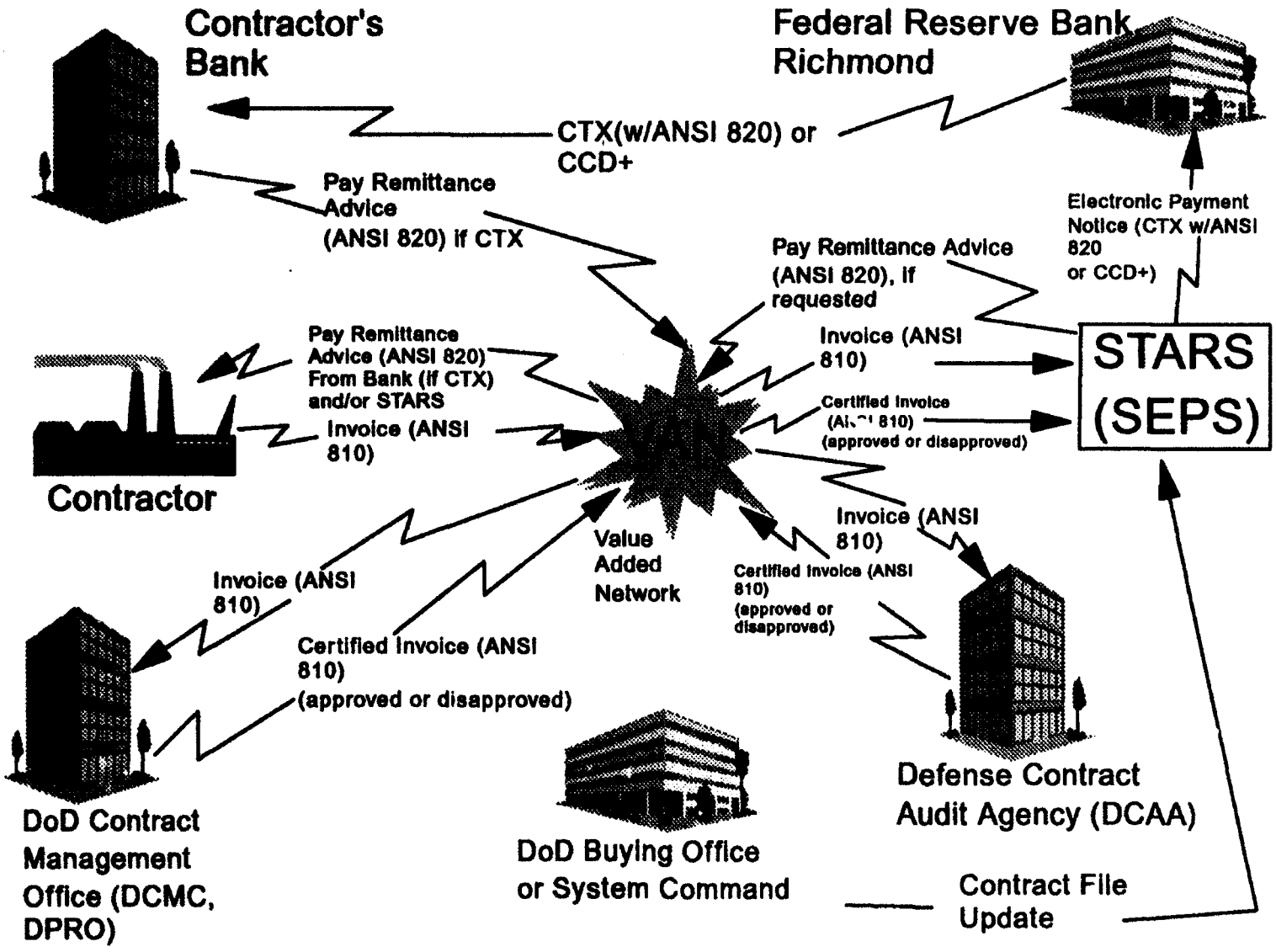


Figure 8: SEPS EDI/EFT Concept Invoice Processing
[Ref. 58: Fig. 3A,3E]

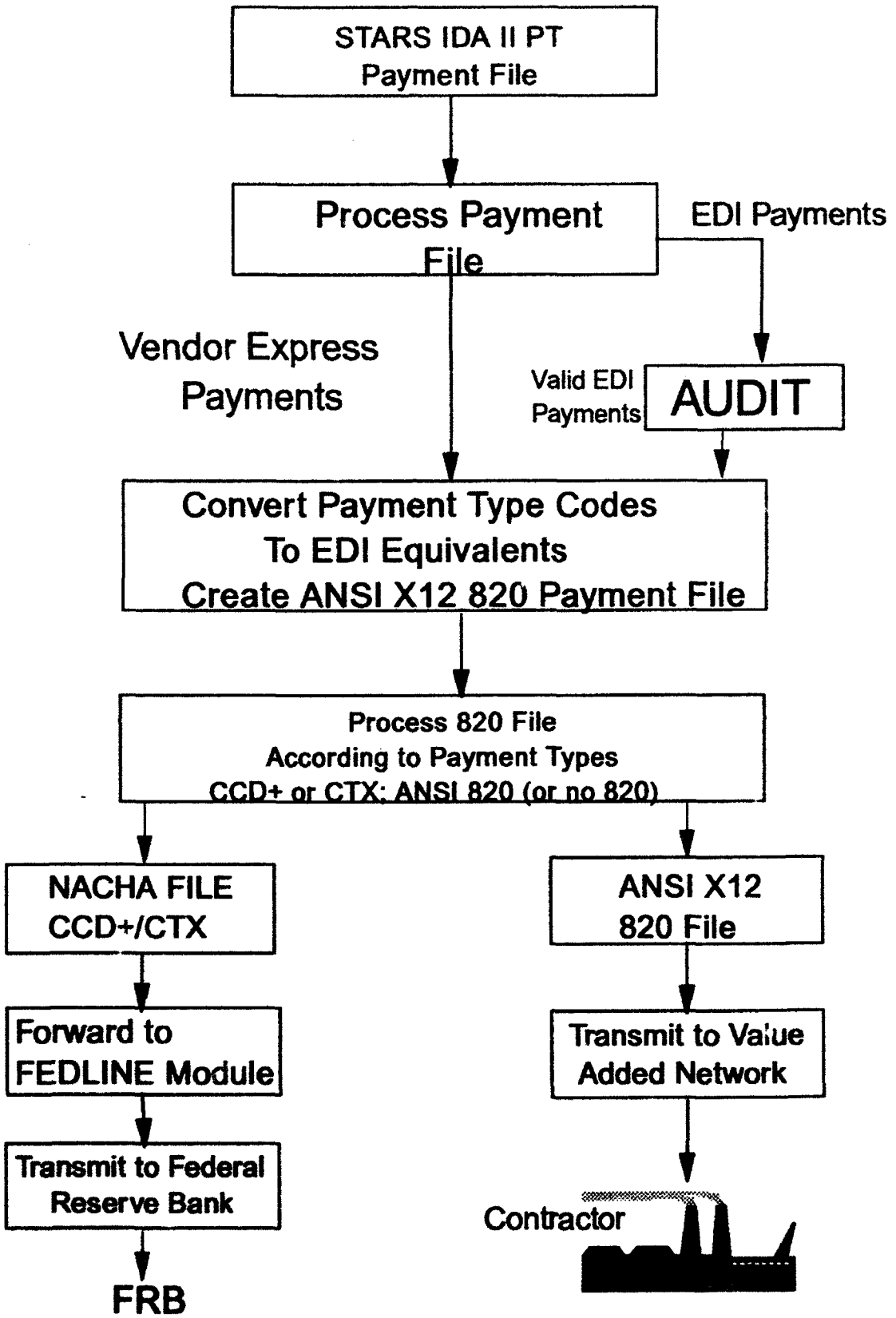


Figure 9: SEPS Financial EDI/EFT Process
[Ref. 58: p. 25]

The SEPS EDI/EFT Expansion Program Master Plan identifies some fundamental characteristics of the SEPS program, as follows:

- To provide a completely paperless administrative system based on electronic processing and communication methods....
- To perform the entire process for contract data distribution, invoicing and payment processing without human intervention or data transcribing from the point of the data source to the final data recipient of each EDI transaction set.
- To define and interlink (or establish) a distributed, functionally oriented network of computer systems and support facilities where each component is designed to function independently but in an environment of planned compatability.
- To employ proven, market matured technology for each component of the system [ANSI X.12 standards].

[Ref. 58: pp. 8-9]

The second bullet listed above identifies the unique approach of SEPS. It is a comprehensive system, from invoice to payment, utilizing key EDI transaction sets [Ref. 58: p. 10]. This approach differs from other DoD activities, which are implementing one EDI application at a time.

c. The "Front-End" Concept of SEPS.

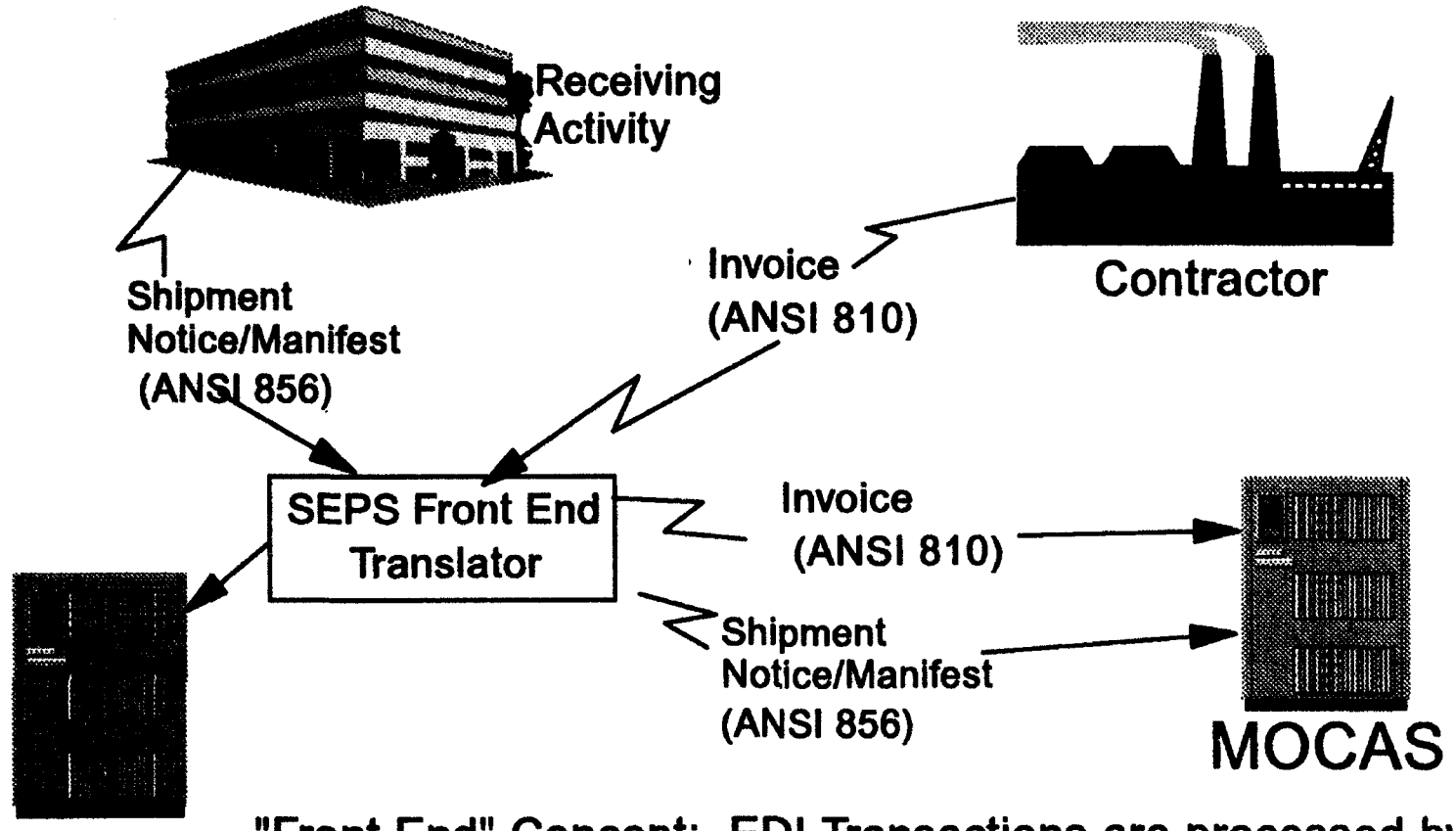
One of the objectives of the SEPS project was to "develop a standard Electronic Data Interchange (EDI) system that is exportable to other Government agencies." [Ref. 76] The feature in SEPS that makes this possible is the "front-end concept" [Ref. 58: p. 10]. This concept is essentially the EDI translator mechanism that permits different systems to interface, as the following passage describes:

> A significant characteristic of the [SEPS] system profile is that the EDI translator system to be used in the program will be operating as a "front end" to the various application system/database environments concerned. This pattern is followed regardless of whether the concerned application is on the same computer system as the translator or on a separate system. Hence, the EDI translator in each case will automatically perform conversion between the EDI standard format and a record structure acceptable by each sender/receiver application system. The second major function of the translator system will be to independently and automatically, or through manual intervention, control communications at each location according to the desires of the user organization. [Ref. 58: p. 10]

The "front end" concept is an important feature to the SEPS user because it allows the invoice processing and electronic payment functions to be performed "transparently", without requiring changes to the user's in-house computer application. Another valuable feature is the "exportability" of SEPS. The SEPS program is capable of being used on other payment/accounting systems, such as MOCAS.is performing. Further, the front end concept is a key factor in the exportability of SEPS to systems other than STARS. The use of SEPS for electronic payment is feasible for other systems, such as MOCAS. Figure 10 depicts a simple diagram of this process.

d. SEPS Implementation Plan.

The SEPS project has a five phase implementation plan which is focusing on the top 20 percent of contracts that comprise approximately 80 percent of the total dollar payments via STARS (i.e., "80/20" rule) [Ref. 58: pp 1,2]. Table 5 provides a summary profile of the contractors targeted by SEPS. One prerequisite for contractors implementing SEPS is that they must be "EDI ready" before implementation [Ref. 77]. One target area for SEPS implementation is service contracts



"Front End" Concept: EDI Transactions are processed by the SEPS translator and converted into a format that is acceptable by the sender/receiver application system (i.e., STARS, MOCAS or other system).

89.

Figure 10: SEPS "Front End"Concept
[Ref. 76]

TABLE 5
SEPS PAYMENT PROFILE

STARS System Population	SEPS Target Population
1,285,000 Invoices	408,637 Invoices (32 percent of total STARS population)
$17 Billion in Payments	$13.8 Billion in Payments
20,000 Vendors	170 Vendors

[Ref. 76]

(i.e., AT&T, Xerox, etc.) utilizing the ANSI 811 (Consolidated Service Invoice/Statement). Some of the prime DoD contractors already on SEPS include GE Aerospace, Newport News Shipbuilding, McDonnell Douglas, and Boeing Defense Systems [Ref. 76]. Implementation is in progress for many other prime DoD contractors, including service contractors [Ref. 76].

e. Summary of the SEPS Program.

The SEPS program is still very much in the implementation phases, thus it would be premature to evaluate its success. By contracting out to EIC for installation and technical support, the SEPS program is utilizing available technology (i.e., commercial technical support, hardware, and software), investing its resources early to obtain a comprehensive system now, rather than trying to develop the system in house. This is reflective of the programs' early Navy EDI program office development. Whether this turns out to be the best approach remains to be seen.

5. Electronic Payments at Aviation Supply Office, Philadelphia.

ASO Philadelphia has been a pioneering activity for the Navy in EDI and electronic payment capabilities. Although the role of ASO Philadelphia in electronic payments is being consolidated under DFAS, the electronic payment capabilities of ASO are still being used today. As stated earlier, an Inventory Control Point requires an information flow between the pay/accounting function and the inventory management function. For this reason the contract payment cycle at ASO Philadelphia will be explored, highlighting how the ICP extracts inventory management information from its Integrated Disbursing and Accounting (IDA) system.

a. Background.

As stated earlier, ASO Philadelphia has been designated as an EDI "Hub" test site for the Navy under the DLA Executive Agent's EDI networking plan [Ref. 69]. ASO Philadelphia might not have been selected for this role had it not been aggressive in EDI implementation. Much of ASO's success is due to Dave Grayson, ASO's resident EDI technical expert, who led the EDI push [Ref. 78]. Today, ASO is active in numerous EDI initiatives, as summarized in the following paragraph:

> ASO has established a trading partner agreement with 30 of the contractors with which they exchange the most paper. They eventually plan to exchange EDI with the top 50 contractors, which account for 75 percent of their business. [Ref. 74: p. 3-2]

ASO currently supports the ANSI 810 (invoice), ANSI 820 (payment order/ remittance advice), and the ANSI 850 (purchase order), among others [Ref. 74: p. 3-2].

A major EDI initiative from ASO has been the Integrated Techical Item Management and Procurement (ITIMP) system, which has been selected as DoD's standard procurement system [Ref. 79]. The ITIMP system is being made EDI capable, largely because of ASO's and Fleet Material Support Office (FMSO) efforts [Ref. 74: p. 3-3]. The Fleet Material Support Office provides computer technical support for Navy activities. ASO continues to increase the number of EDI transaction sets it can process, and it is exploring its next technological step, digitized technical data [Ref. 80].

b. Electronic Payment Capabilities at ASO Philadelphia.

Electronic payment was one of the first EDI transaction capabilities implemented at ASO. Use of the ANSI 820 (payment order/remittance advice) was added to the IDA G06 (payment) function in April 1991. As of June 1992, 54,300 transactions worth $188 million were transmitted electronically [Ref. 81: p. 11]. Because of the DMRD 910 consolidation effort, electronic payments are on the downswing at ASO, as older contracts close out and new contracts are paid out of a DFAS office.

c. ASO Philadelphia's Electronic Payment Cycle.

As previously stated, inventory management is critical to ASO Philadelphia's mission. The existing IDA (G06) payment system, although old technology, does provide ASO with data that it can use to help in its inventory functions. Figure 11 represents a simplified flow chart of the payment cycle at ASO Philadelphia. The electronic invoice and payment capabilities are of secondary importance to the data query

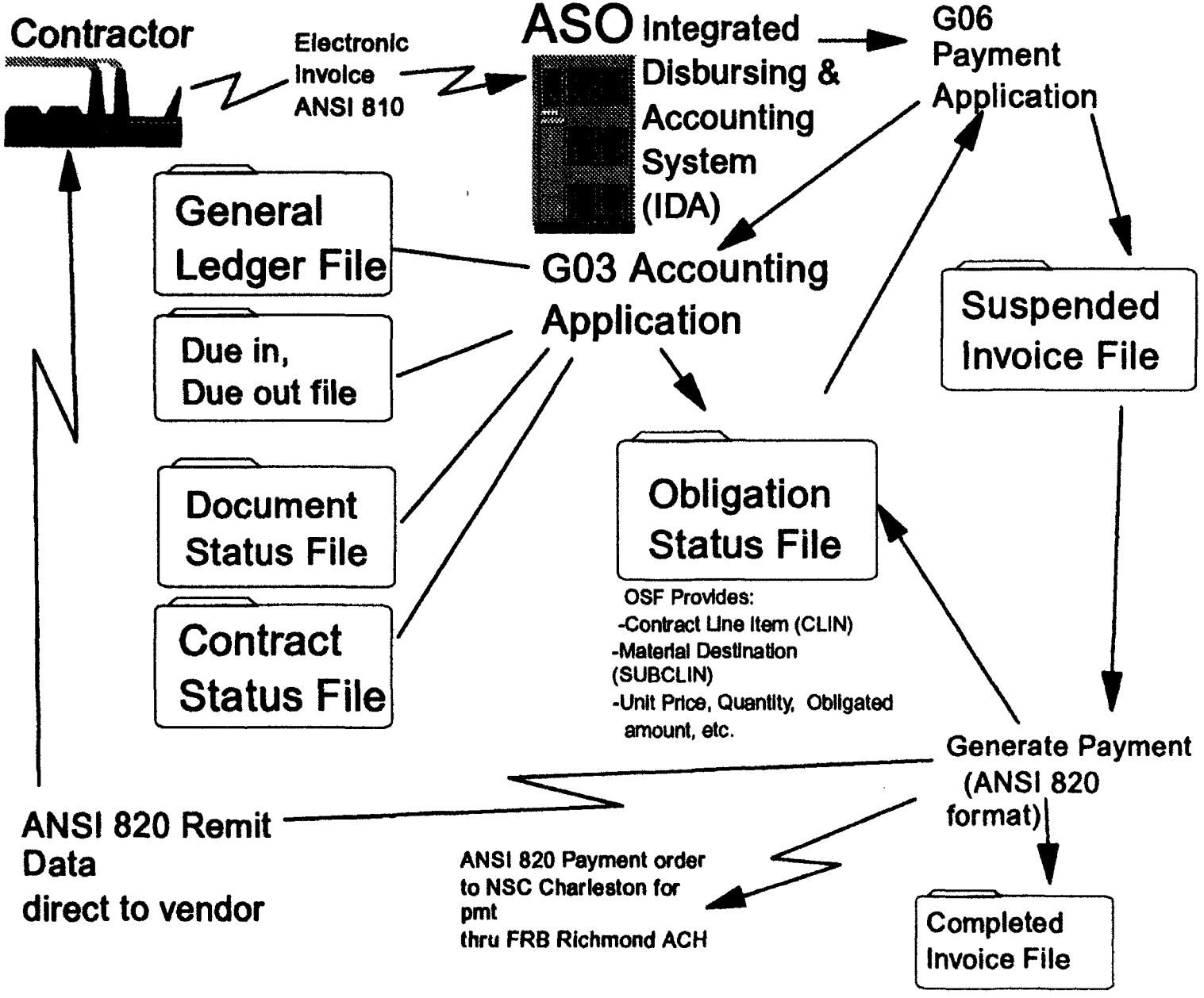


Figure 11: ASO Philadelphia IDA Payment Process

capabilities that ASO can perform. Specifically, under the Obligation Status File (OSF), ASO users can extract contract payment information using a variety of data entry methods, including contract line item (CLIN), ultimate destination (SUBCLIN), inventory quantities on order, and unit price per contract [Ref. 45]. As such, the IDA (G06) system, while primarily a payment function, permits data query capabilities that support the ICP mission.

d. The PX Financial Accounting System.

The next generation financial accounting system, PX, is currently under development and test at ASO Philadelphia. The PX system has the following objectives:

- Provide stronger fiscal and material control.
- Achieve optimum utilization of resources by improving the efficiency of the design.
- Improve creditability (sic) of procurement and fiscal accounting information by ensuring data base integrity.
- Enhance decision making and control by providing timely and accurate management information. [Ref. 82]

The PX system is designed to reduce redundancies and shortfalls of the IDA system. Since PX is still in the early implementation phase, it is unclear what changes, if any, will occur with the electronic payment of remaining contracts on the IDA system.

6. Electronic Payments at DFAS-Columbus Center.

Electronic payment expansion at DFAS-Columbus Center became a priority following recommendations made in the LMI report, Defense Finance and Accounting Service: An Electronic Commerce Program,

published in May 1991 [Ref. 48: pp. 3-5,6]. In that report, LMI provided the following assessment:

> Our assessment shows that many of the paper documents processed in the CAS (Contract Administration Services) and Stock fund payment mission areas are excellent EDI candidates. Both areas process a large and increasing number of documents; they have a manageable number of trading partners, most of whom are EDI capable; and they have the automated systems needed to support EDI transactions.
> [Ref. 48: p. 3-6]

Before exploring the electronic payment capabilities of DFAS-Columbus Center, an overview of its overall EDI program related to contract payments will be given. Many of the EDI applications under development now are the same transactions described in the pay/accounting cycle flow chart (i.e., invoice, shipment notice, etc.). They play a critical role in the overall success of DFAS-Columbus Center's role as one of DoD's paying activities.

a. The Electronic Commerce Plan at DFAS-Columbus Center.

The LMI report on DFAS-Columbus Center's Electronic Commerce program provides the roadmap for DFAS to follow as it implements EDI. Figure 12 provides a schematic of the LMI plan, and shows those EDI ANSI X.12 transaction sets that DFAS-Columbus Center has or will be implementing. DFAS-Columbus Center has broken down its EDI implementation plan into phases, as described below:

> **Phase I: Standardize and Expand existing EDI initiatives:** Accomplishments to date include full EFT support for contract administration.... In August 1992 a standard floppy disk application will be available to allow contractors to submit invoices and progress billings on floppy disks. Early in FY 93, a standard bulletin board system will be implemented, supporting not only invoices and progress payments, but also shipment notices.

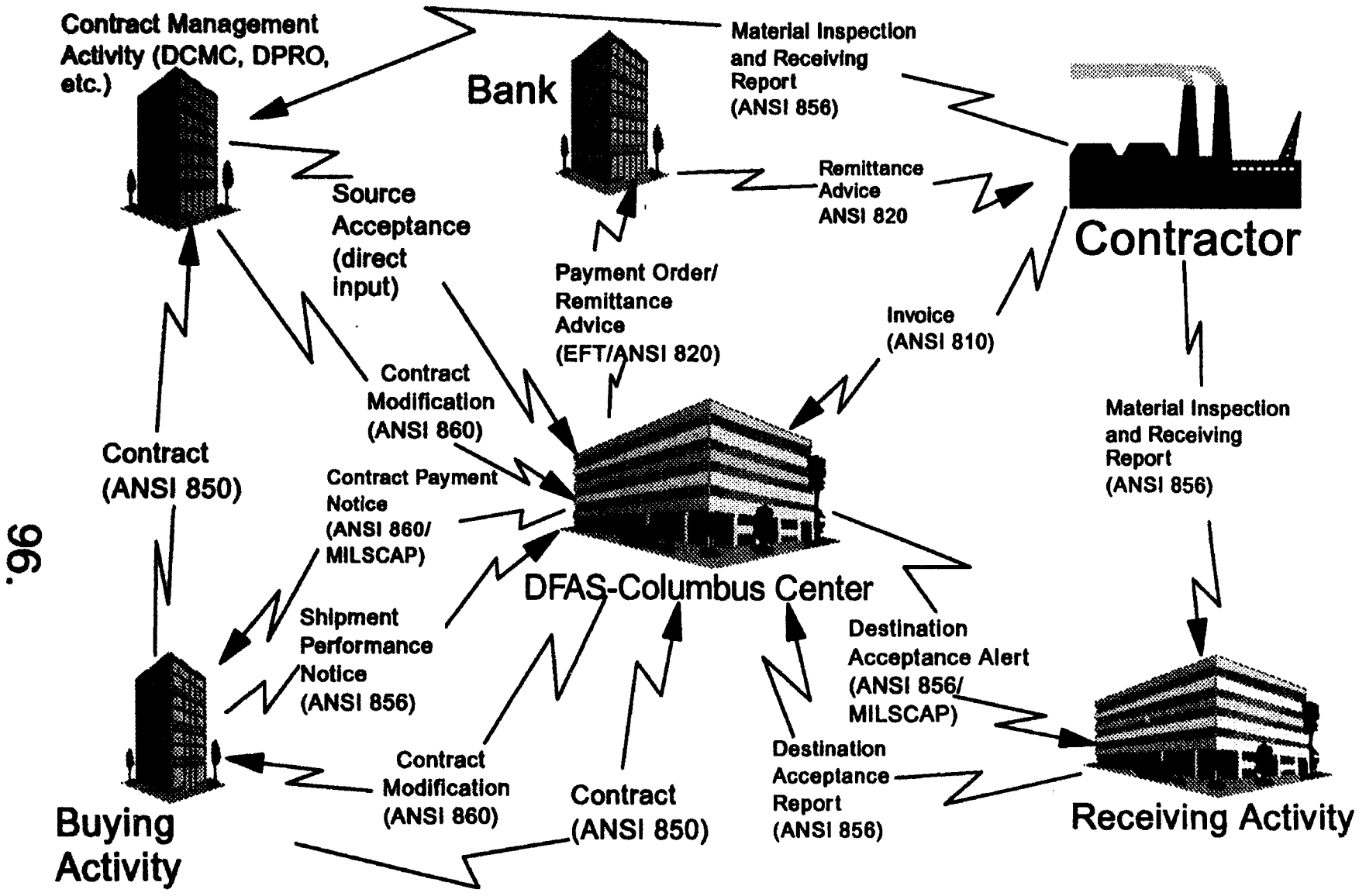


Figure 12: DFAS-Columbus Center EDI Plan For CAS Payments

[Ref. 48: Fig. 4-1]

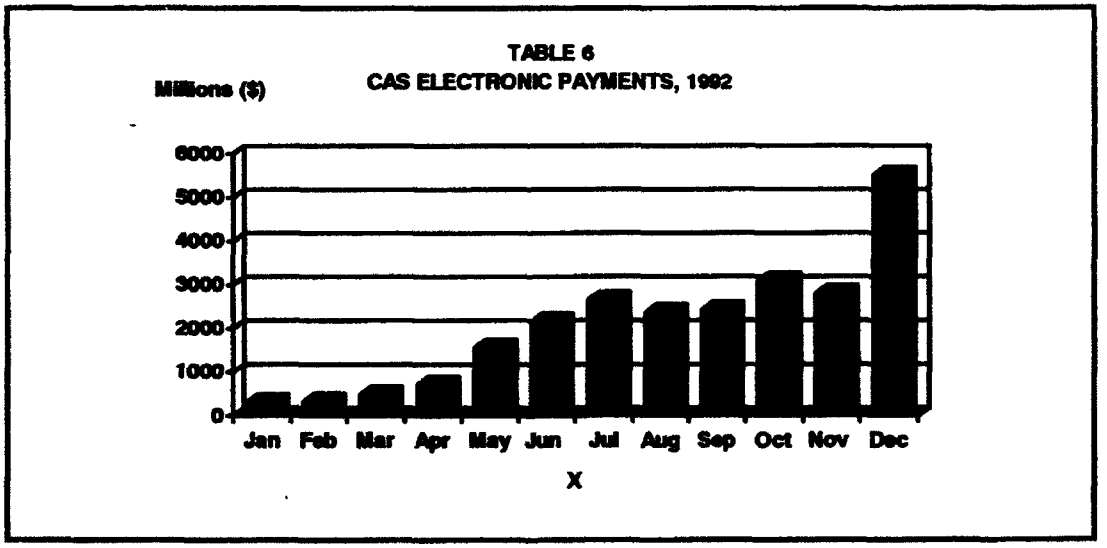
> Phase II: Implement ANSI X.12 EDI for Invoices/Shipment Data: Since paybacks were high and implementation costs relatively low, [ANSI] 856 Shipment notices and 810 invoices (which include progress billings, commercial invoices and public vouchers) were selected as initial EDI candidates.
>
> Phase III: Expand ANSI X.12 EDI to Contracting and Acceptance: In this phase, contracts [ANSI] (850) and modifications (860) will be electronically transmitted from the military procurement offices to DFAS-CO. DCMC [Defense Contract Management Command] modifications, and calls against Basic Ordering Agreements [BOA's] would also be processed electronically. Further enhancements will allow government consignees to transmit [ANSI] 861 Receiving Advice and 863 Inspection and Testing Results to DFAS-CO.
>
> [Ref. 5: pp. 5-7]

One of the challenges of implementing EDI at DFAS-Columbus Center is getting a consensus with the other DoD activities on the data conventions to be used for some of the transaction sets [Ref. 54]. Data conventions, the "ground rules" on the use of the ANSI X.12 transaction sets, must be agreed to by both Defense Contract Audit Agency (DCAA) for the ANSI 810 (invoice) and 805 (public voucher continuation) transaction sets. Defense Contract Managment Command (DCMC) must agree to the ANSI 856 (Shipment Notice/Manifest) [Ref. 5: p. 6]. Once the conventions are agreed to, the DoD documents being replaced (i.e., the ANSI 856 replacing the DD Form 250, the ANSI 810 replacing the DD Form 250, SF 1443, and SF 1034) must be "mapped" into the EDI transaction set format. Testing and implementation of each transaction set follows the mapping process. Altogether, these steps take time to accomplish, thus the DFAS-Columbus Center electronic commerce plan is not progressing as fast as the STARS/SEPS program. DFAS-Columbus is developing its EDI program "in-house" at a relatively low cost (approximately $60,000 for software) [Ref. 54]. Thus, any comparison between approaches needs to take into

consideration the cost element. As of late April 1993, the ANSI 810 (invoice) and ANSI 856 (shipping notice) were still in the testing phase at DFAS-Columbus Center [Ref. 83].

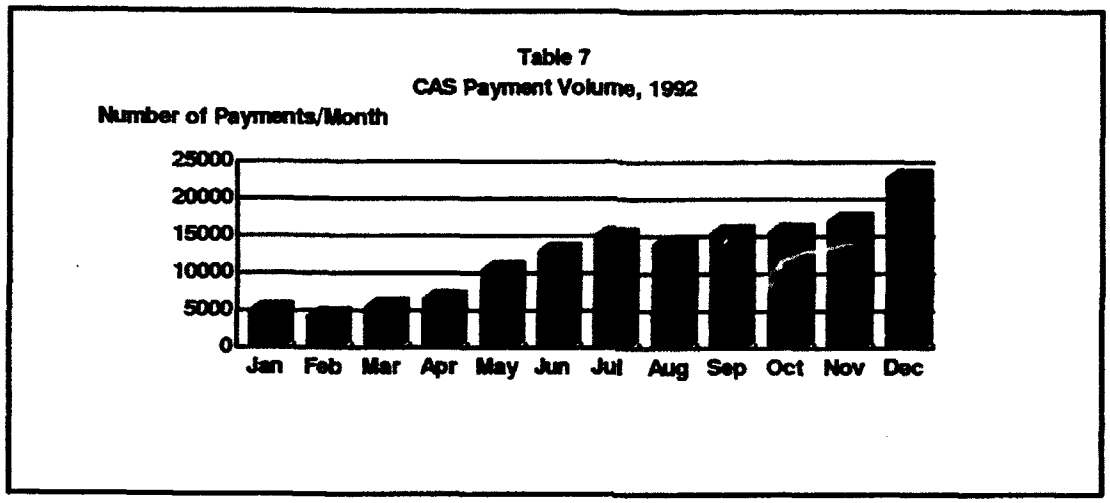
b. The Electronic Payment Process at DFAS-Columbus Center.

Electronic Payments were developed and initiated at DFAS-Columbus Center in January 1990, well before the Electronic Commerce plan was put into effect [Ref. 50]. The Electronic Commerce plan's objective of expanding electronic payments, when coupled with the DMRD 910 consolidation effort, has greatly expanded the use of electronic payments at DFAS-Columbus Center. Table 6 depicts the growth of Contact Administration Services (CAS) electronic payments over calendar year 1992.



[Ref. 50]

Table 7 below depicts the total volume of electronic payments for calendar year 1992. The EFT payment function in MOCAS utilizes the



[Ref. 50]

CTX application for payment [Ref. 84: p. 4]. This application permits the use of the ANSI 820 (payment order/remittance advice) transaction set within the CTX (Corporate Trade Exchange) application.

The following passage describes how payments are issued with the MOCAS system:

> The ability to choose EFT as a method of disbursement will be at contract (PINN/SPIIN) level and not at contractor (CAGE) [Commercial And Government Entry (CAGE) code] level. Routing transit numbers (RTN) or American Banking Association (ABA) numbers and contractors financial institution account numbers will be established at contract level and should be handled as possible remit-to-addresses. [Ref. 84: p. 3]

Two points should be made about the MOCAS electronic payment process. First, MOCAS payments are generated by contract number, not by contractor. The CAGE code is a five digit number assigned to each Government contractor. Since payment is by contract number and not CAGE code, multiple payments to the same contractor will be processed individually if not from the same contract. This is a concern for both DFAS-Columbus Center and contractors, and will be discussed later.

Second, electronic payments do not generate remittance data to send to the contractor [Ref. 50]. All remittance data on the CTX transaction is included in the electronic transmission. This is a major issue for some contractors, who receive EFT payments but do not receive remittance data from their bank This issue will be explored in detail in Chapters IV and V. Table 8 below summarizes some of the general information about electronic payments at DFAS-Columbus Center.

TABLE 8
GENERAL INFORMATION ON ELECTRONIC PAYMENTS
AT DFAS-COLUMBUS CENTER

Contractors on EFT	
All five CAS directorates	2,300
Stock Funds (SAMMS)	370
Contracts Added to EFT	
New Awards - CAS	1,000
New Signups - CAS	5,500
Contracts Presently on EFT	
CAS Contracts	130,000

[Ref. 50]

c. The Role of the EFT Office at DFAS-Columbus Center.

Glenda Brown, who heads the electronic payment office at DFAS-Columbus, says that a typical EFT payment saves three dollars over its paper check counterpart [Ref. 50]. The EFT office at DFAS-Columbus Center is a leading proponent of electronic payments. Its role includes furnishing information on EFT applications, entering contractors onto the MOCAS EFT function, managing the EFT function, and conducting seminars and training on the electronic payment capabilities at

DFAS-Columbus Center [Ref. 50]. The EFT office acts as the liason between the contractor and DFAS on all EFT related issues and frequently fields pay status inquiries for impatient contractors [Ref. 50].

d. Invoice Processing at DFAS-Columbus Center.

The importance of the internal process by which DFAS-Columbus Center performs its data entry, review and audit, approval,and payment functions cannot be overemphasized. Without an accurate, efficient system, the electronic payment at the end of the process could be in error or lead to further errors in the overall pay/accounting cycle. The process is outlined here to help with a general understanding of how it works. Figure 13 provides a diagram of the process and the steps involved. It does not, by any measure, indicate the possible problems or issues that may slow down or stop the payment process.

There are several points to make about the invoice payment process. First, the phrase "garbage in, garbage out" applies to the MOCAS system. Because of the standardized MILSCAP format, for any payment out of MOCAS to be correct, the information flowing in must be accurate and complete. Second, when a contractor signs on for electronic payments, it must do so using a Trading Partner Agreement (TPA). The Federal Acquisition Regulation (FAR) requires that an EFT clause for each contract be included [Ref. 65: 52.232-28]. Consequently, any contractor currently being paid electronically from any Government activity must resubmit its request for electronic payment for each contract. For existing contracts, this requires a contract modification. Third, when the disbursing division of DFAS-Columbus

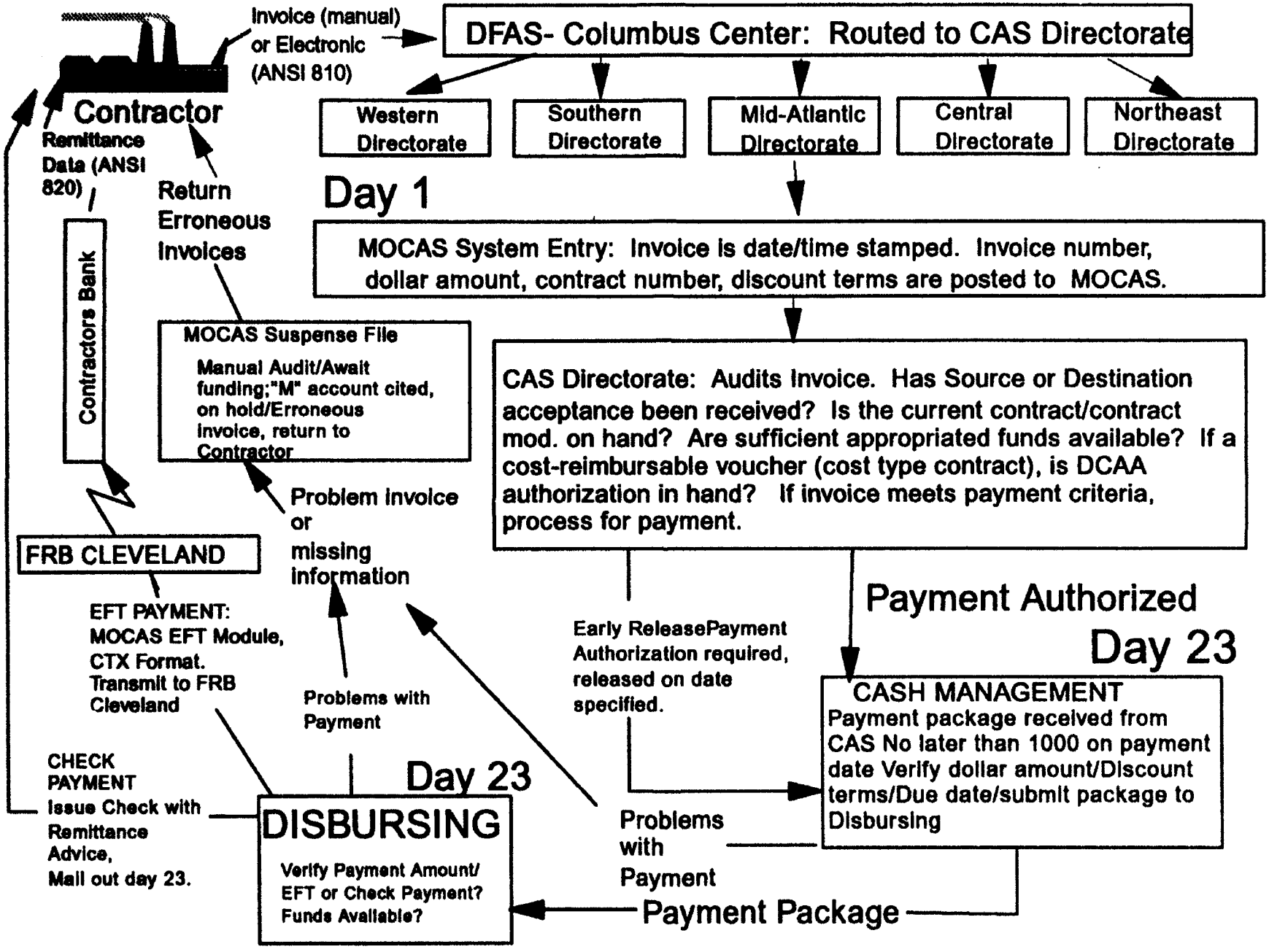


Figure 13: DFAS-Columbus Center Invoice Processing Cycle

Center generates its daily MOCAS EFT transmission, it is under a tight schedule from the Federal Reserve Bank to get the payment transmission out on time. Fourth, if an EFT payment is rejected by the receiving bank, this sets in motion a series of transactions with the Federal Reserve and labor intensive steps by DFAS-Columbus Center to resolve the problem.

e. Summary of the Electronic Payment Function at DFAS-Columbus Center.

DFAS-Columbus Center is, by design, an invoice processing factory. The amount of invoice, receipt documentation, and supporting contract information necessary to complete a single pay transaction is immense. If any of that documentation is missing or inaccurate, the payment process is suspended indefinitely until the problem is resolved. The EDI initiatives underway are designed to eliminate much of the paper flow. For instance, the ANSI 810 (invoice) will eliminate all the invoice mailroom receipt and distribution, data key entry, and routing from the CAS Directorate to Cash Management and Disbursing for payment [Ref. 54]. There are "cultural" barriers to break down as a result, since the "way of doing business" is to have the hard copy invoice in hand. All activities, not just DFAS-Columbus Center, must deal with these cultural change issues.

7. Summary of the Electronic Payment Functions in DoD.

This section has provided an overview of just a few DoD activities, and what they are doing in the electronic payments and EDI areas. The sheer number of EDI projects and DoD activities that are

actively involved in DoD's Electronic Commerce Program prohibits analyzing them all. Each of the activities discussed in this study, as a critical step in the pay/accounting cycle, is impacted in a different way by the EDI and EFT initiatives and the DRMD 910 consolidation. The issues alluded to throughout this chapter which impact each activity will be the focus of the remainder of this study.

CHAPTER III: RESEARCH METHODOLOGY

A. BACKGROUND.

The purpose of this study is to determine if DoD's electronic payment capabilities are improving the contract payment process. In order to answer this question, a better understanding of the electronic payment process was necessary, as described in Chapter II. There were several methods of data collection used. A thorough review of the current literature was conducted. Several of the more significant and helpful writings will be reviewed here.

This study used three other methods of data collection. First, personal and telephone interviews played the most important role in the research. Discussion with the users of the electronic payment applications in both DoD and private industry helped clarify complex issues and keep the study in focus. Second, a defense contractor survey highlights electronic payment issues as seen from the contractor's perspective, with a specific focus on the electronic payment capabilities and support provided by DFAS-Columbus Center. Finally, with the financial support provided by the DLA EDI Executive Agent office, several DoD activities were visited. This was an excellent opportunity to get a first-hand look at the electronic payment programs and to discuss the concerns of those actively involved in the process.

B. LITERATURE REVIEW.

Understanding the concepts behind electronic payments and EDI, the DoD accounting/payment cycle, and the structure of the Federal Reserve System required a thorough analysis of available literature. In this section a brief review of the more significant and helpful writings in the electronic payment, EDI, and DoD accounting areas will be provided. Of particular note is one groundbreaking research effort entitled An Analysis of the Potential Use of Corporate Trade Payments by the Navy, a Naval Postgraduate School thesis study by Maj. F.C. Alke in 1984, which explored the possibility of the use of electronic payments within DoD for other than payroll deposits. This study was conducted when electronic payment use was in its infancy, and helped lay the groundwork for this study. [Ref. 6]

1. The Federal Reserve and U.S. Banking Industry Literature.

Three references in particular were helpful in understanding the banking infrastructure. The book entitled The U.S. Payment System: Efficiency, Risk, and the Role of the Federal Reserve provides a collection of presentations from a symposium held by the Federal Reserve Bank of Richmond, Virginia in 1990. It offers an excellent source of information on the workings of the Federal Reserve and banking industry [Ref. 11]. The Federal Reserve Bulletin likewise is an excellent source of information on the inner workings of the Federal Reserve. The National Automated Clearing House Association (NACHA) (an electronic payment network governing body) publication 1993 ACH Rules: A Complete Guide to Rules & Regulations

Governing the ACH Network also provided a wealth of information on banking processes and EFT guidelines [Ref. 9].

2. EFT, EDI and Financial EDI Literature.

There is a wealth of information available in these three subject areas. In addition to the 1993 ACH Rules cited above, trade journals such as EDI World and EDI Forum provide timely readings on electronic payment and EDI issues. One article in particular "Introduction to EFT and Financial EDI" by N.C. Hill and D.M Ferguson provides an excellent overview of EFT and EDI issues [Ref. 1].

A landmark study on EFT was published by the National Commission on Electronic Fund Transfers, EFT in the United States: Policy Recommendations and the Public Interest. This 1977 study addressed the regulatory and social impact of EFT before its rapid expansion in the 1980's. Public policy recommendations for electronic payments were generated as a result. [Ref. 10]

Several publications provide valuable information on EDI applications. The CoreStates Financial Corporation booklet One to Get Ready: How to Prepare Your Company For EDI, written by B.K. Stone, explains succinctly how EDI works [Ref. 23]. A publication distributed by the National Institute of Standards and Technology (U.S. Department of Commerce), Federal Information Processing Standards Publication 161, Electronic Data Interchange, provides a more technical explanation of EDI and the Federal Government standards [Ref. 32].

Among the most useful resources on EFT and EDI applications within DoD are reports generated by the Logistics Management Institute (LMI). Three reports in particular, (1) A Business Case for Electronic Commerce by T. Hardcastle and T. Heard [Ref. 3], (2) An Operating Concept for Electronic Funds Transfer, by T. Heard, W.M. Bridges, and T. Hardcastle [Ref. 22], and (3) EDI Planning and Implementation Guide, by T. Hardcastle [Ref. 36], were invaluable to this study. LMI has generated numerous other reports in support of DoD's Electronic Commerce program which also provide valuable information.

3. DoD Payment/Accounting system and EDI program literature.

There are several DoD-specific publications that were helpful in understanding the DoD payment/accounting process. The LMI report An Electronic Commerce Program for the Defense Finance and Accounting Service, Columbus Center by T. Hardcastle and W. Ledder provides an excellent overview of the DFAS organizational structure [Ref. 48]. The STARS/SEPS EDI/EFT Expansion Program Master Plan distributed by the EDI Integration Corporation provides an excellent overview of the Navy's Standard Accounting and Reporting System (STARS) electronic payment system [Ref. 58].

Two DoD publications, the DoD Implementation Guidelines for Electronic Data Interchange [Ref. 4], and the Navy's Strategic Plan for Electronic Data Interchange [Ref. 74] explain in detail the goals, objectives, and guidelines for EDI within DoD and the Navy,

respectively. They also provide an overview of EDI initiatives underway within DoD.

There are many other articles and publications which provided valuable information for this study that are too numerous to acknowledge here. A review of the List of References at the end of this study will identify the remaining sources.

C. THE INTERVIEWING PROCESS.

Personal and telephone interviews with key individuals involved in electronic payment and EDI issues provided the best source of information and guidance for this study. Interviews were conducted with numerous DoD and non-DoD activities, as the following paragraphs describe. Appendix D lists the key personnel interviewed and a sample of the questions for them.

1. DFAS-Cleveland, Washington, D.C. Office (STARS/SEPS).

The DFAS-Cleveland (Washington, D.C.) office was instrumental in clarifying difficult concepts in both EFT and the DoD contract payment system. DFAS-Cleveland personnel provided summary information on the SEPS project, a detailed explanation of the interface between SEPS and DoD accounting applications, and data security issues.

2. DFAS-Columbus Center.

The electronic payment processes and EDI projects at DFAS-Columbus Center were discussed at length in numerous telephone and personal interviews. The EFT payment office staff provided a thorough overview of the EFT payment process at Columbus and highlighted numerous

payment issues, including the MOCAS system's electronic payment capabilities, DFAS-Columbus Center's internal document flow procedures, and contractor concerns related to electronic payments. They were also instrumental in critiquing the contractor survey. The EDI Program Manager for DFAS headquarters in Washington, D.C. (responsible for DFAS-Columbus Center EDI initiatives), helped clarify the Electronic Commerce program within DFAS. The Public Affairs Office at Columbus provided substantial background information on DFAS, and also obtained authorization for use of the DFAS-Columbus Center contractor database for the electronic payments survey. The DFAS-Columbus Center EDI project office provided updates on EDI pilot projects, ANSI X.12 applications being tested, and an overview of the Contractor Inquiry System (COINS). The Director of the Southern Contract Administration Services (CAS) Directorate outlined the issues affecting invoice processing. Observations about "M" account problems, missing contract information, and the Prompt Payment cycle helped expand the focus of the research beyond purely DFAS payment issues to pay/accounting process issues. (The "M" account is a holding account for appropriated funds which have expired, but not lapsed. The M account is being liquidated by the end of Fiscal Year 1993. Consequently, there are invoices charging appropriations in the M account which require resolution before September 30, 1993.) The AMIS/MOCAS project office at Columbus provided an overview of the project to merge the AMIS payment function into MOCAS. Overall, DFAS-Columbus Center personnel were very helpful in clarifying the processes and issues related to electronic payments.

3. Aviation Supply Office, Philadelphia.

Personnel at ASO Philadelphia provided insight into the problems that are faced by both an ICP and accounting activity as a result of the consolidation of payments under DFAS. Information was gathered on ASO's electronic payment capabilities and the capitalization effort taking place under DFAS-Cleveland. Topics discussed included the data query needs of the ICP, the capabilities of ASO's IDA and PX systems, and the shortcomings of the payment data available on MOCAS. Valuable input was also provided on the electronic payments survey. The EDI Project Office provided an overview of EDI initiatives at ASO, and suggested questions for the electronic payment survey. ASO accounting personnel expanded upon the difficulties in extracting data from MOCAS and highlighted the manual process necessary to correct undistributed disbursements. Document distribution problems (specifically, missing contracts and/or contract modifications required by DFAS) that ASO is experiencing with DFAS-Columbus Center were discussed. Data to support those concerns were provided.

4. Defense Logistics Agency (DLA) EDI-Executive Agent Office.

The DLA EDI Executive Agent (EA) Office not only has provided sponsorship for this study but also has been the source of a wealth of information on the "big picture" of the DoD Electronic Commerce Program. Information gathered included an explanation of DLA's role in accomplishing the DMRD 941 objectives, seed money distribution, EDI project support, and the EA's role in developing EDI policy. The details of the EDI "Hub" concept were explained. The Executive Agent

Resource Management Office helped explain many of the EDI technical issues (communication protocols, gateway processors, and EDI standards), including some insights into the role of the ANSI X.12 subcommittee. An overview of DLA's Productivity Enhancement Training (PET) program for small businesses was also provided.

5. Private Sector and Banking Industry.

There were several key organizations outside of DoD that provided valuable information to this study. The Northern California EDI Users Group (a non-profit professional organization in the San Francisco area to promote EDI use), provided information on current Financial EDI issues in industry and offered valuable suggestions for the electronic payments contractor survey. Within the banking industry, the Huntington Bank (Columbus, Ohio), provided a "banker's view" of EFT and EDI initiatives. The Calwestern ACH Association (CACHA) helped explain the functions of the ACH network and the role of the ACH associations under the Federal Reserve Bank. The Financial Management Service (San Francisco office) of the U.S. Treasury helped explain Vendor Express, the purpose of the "Green Book" (Federal Government ACH rules), and the FMS role in auditing DoD Statements of Accountability.

6. Summary of the Interview Process.

The interviews (telephone and personal) conducted as part of the data collection effort for this study helped shape the study beyond EFT issues alone (which was the initial intent). Through the discussions identified above (and others not listed for brevity's sake), the bond between electronic payments and accounting issues became clearer. The

interviews helped gain an appreciation for the complexity of the electronic pay and accounting issues discussed, in particular with the many DoD systems involved in the process. These complexities lead to problems, which will be discussed in Chapters IV and V.

D. THE DEFENSE CONTRACTOR SURVEY ON ELECTRONIC PAYMENTS.

The ultimate "customers" of the DoD electronic payment process are the defense contractors. Their opinion is an important element in assessing how the process is working. To obtain defense contractor opinion, a survey was sent to 500 DFAS-Columbus Center customers, all identified as electronic payment recipients. Appendix E provides a sample copy of the survey. This section will discuss how the survey was developed, the method of random selection of contractors for the survey, and a brief overview of the key sections in the survey.

1. Electronic Payment Survey Development.

The electronic payments survey was developed to better understand the contractor's perspective on DoD electronic payment capabilities, and to do so in a format which would permit data collection in an effective and efficient manner. Specifically, the survey was designed to query contractors in the three areas listed below:

- General background information about the contractor and its EFT/ Financial EDI capabilities: The questions in this area requested sales and volume information about the contractor, information about its EFT and EDI capabilities, and some evaluative questions on the benefits of EFT.

- An evaluation of the electronic payment capabilities of DFAS-Columbus Center: Contractors were asked to evaluate DFAS-Columbus Center's payment capabilities "before and after" EFT, evaluate Columbus' customer service functions, and offer suggestions for improvement.

- An evaluation of bank support for the contractors' electronic payment needs: Contractors were asked to identify and evaluate the EFT/Financial EDI services provided by their bank (if known), and provide an overall assessment of their bank's support for their needs.

The assistance of several key individuals in drafting and critiquing the survey was obtained. Ultimately it was the support from DFAS-Columbus Center personnel that made the survey possible.

2. The Survey Database and Contractor Selection Process.

The database selected for the contractor survey was provided by DFAS-Columbus Center. It consisted of database files from four of the five CAS Directorates (Northeast, Southern, Central, Mid-Atlantic). The Western CAS directorate database was not available at the time the contractors for the survey were selected. Combined, the four database files listed 1602 DoD contractors identified as electronic payment recipients.

The four database files were consolidated into one list. Utilizing a random number table [Ref. 85: p. 810., a starting point (contractor number 539) was selected, with every third contractor on the list chosen for the survey (i.e., 539, 542, 545, etc.) until the 500 were identified. Surveys were mailed out on 30 January 1993. All the contractors that surveys were sent to were told that survey responses would be kept strictly confidential. There were 151 responses (30.2%) received. Chapter .' will provide survey results.

E. OBSERVATIONS CONDUCTED DURING SITE VISITS.

Because of the complexity and diversity of the systems and processes being reviewed, travel to the respective DoD activities involved in the EFT and EDI processes was deemed essential to this study. It is a fair assessment to say that, without the associated travel, the analysis of the concepts and issues discussed in this study would have been superficial at best. Visiting the DoD activities and talking with those involved in the day-to-day electronic payment and EDI issues provided insight into the concerns and problems of the contract payment process from different perspectives. A greater appreciation of the interrelationship between the payment and accounting processes was developed. As a result, the focus of this study has expanded to include some of the accounting cycle issues, which ultimately impact the success or failure of the payment process. In this section the objective of the DoD site visits will be discussed.

1. DFAS-Columbus Center.

Since a significant portion of DoD contract payments is now being paid out of DFAS-Columbus Center, the purpose of the visit (from February 22-24, 1993) was to better understand the electronic payment processes and observe the steps taken by DFAS to process an invoice for payment. A significant portion of the trip was spent visiting those divisions involved in the invoice payment process (Contract Administrative Services (CAS) Directorates, Cash Management, Disbursing, EFT Payment Office). Interviews were conducted with key personnel in each phase of the payment process. The DFAS-Columbus Center invoice

payment cycle flow chart provided in Chapter II (Figure 13) was the product of these observations.

2. Aviation Supply Office, Philadelphia.

ASO Philadelphia was visited on February 25-26, 1993 to assess the impact that the consolidation of contract payments under DFAS was having on its electronic payment capabilities. An overview of ASO's electronic payment and EDI capabilities and discussion of the impact that consolidation of payments was having on ASO were conducted. Much of the remainder of the visit was focused on pay/accounting problems and those issues that impacted ASO as an AAA and ICP activity. Unmatched disbursement issues, MOCAS data query capabilities, and information requirements from DFAS-Columbus Center are areas of concern at ASO and were reviewed at length. It became more evident with the information gathered at ASO that the pay and accounting processes were tightly intertwined. The issues discussed with ASO personnel will be covered in detail in Chapter IV.

3. Defense Logistics Agency EDI Executive Agent Office.

The purpose of the visit to DLA was to gain a better understanding of the Executive Agent's role in DoD EDI initiatives. During the visit of March 1, 1993, DLA's role as the technical advisor to DoD on EDI was explained in detail, as was its role in significant EDI projects, such as the EDI "Hub" concept. Because of the diversity of EDI projects underway throughout DoD, it was important to learn that DLA does not micromanage EDI projects. Rather, it provides the overall guidance for DoD to follow.

4. NAVSUP EDI Projects Management Office and DFAS-Cleveland.

Interviews at both NAVSUP and DFAS-Cleveland (Washington Branch Office) were conducted on March 2, 1993 at Crystal City, Washington, D.C. The focus of the NAVSUP visit was to get a current overview of EDI initiatives underway, with particular focus on the translator site project highlighted in Chapter II. At DFAS-Cleveland, a lengthy discussion on the STARS/SEPS project and the Navy's Financial Reporting System (FRS) processes was held. Current data on the SEPS project were obtained and a discussion was held on the STARS system's role in the Navy's payment/accounting process.

5. The Payment/Accounting Cycle.

With the data obtained during the site visits and through interviews, the payment/accounting cycle (in Appendix C) was more easily understood. While this study is focusing on electronic payment issues, it appears that the majority of the problems in paying contracts are not specifically EFT or EDI related but, rather, revolve around accounting issues. Because the payment and accounting functions are inseparable, these accounting issues will be examined in the remaining chapters along with the electronic payment issues. After examining the issues, a determination will be made as to whether electronic payment capabilities can provide solutions to some of these problems.

CHAPTER IV. PRESENTATION OF DATA

A. OVERVIEW.

This chapter will focus on the specific problems and issues associated with electronic payments that were identified through the literature review, interviews, and observations conducted as part of this study. These issues will be addressed in three sections. First, issues related to DoD's electronic payment processes will be provided. These issues are identified by the following headings:

- Regulatory issues regarding EFT.
- Trading Partner Agreements (TPAs).
- Bank competition for electronic payment services.
- Cash Management and "float" issues.
- Factors influencing DFAS-Columbus Center's electronic payment process.

In the second part of the chapter an examination of DoD payment/accounting cycle issues from two perspectives will be provided. First, those impediments to invoice processing at DFAS-Columbus Center will be addressed. Second, issues affecting the Aviation Supply Office (ASO) Philadelphia, as the buying, inventory control, and accounting activity, will be addressed.

The third and final section of this chapter will present the contractor electronic payment survey results. Following this data

presentation, Chapter V will synthesize the information collected, and provide an analysis of where DoD electronic payment capabilities stand today.

B. ISSUES RELATED TO DoD ELECTRONIC PAYMENTS.

Electronic payments involve more than just the bank-to-bank transfer of funds. Within DoD there are relationships between trading partners, restrictive payment regulations, and a complex payment process around which issues have developed.

1. Regulatory Issues with DoD Electronic Payments.

Three regulatory issues will be addressed. The first deals with the FAR requirement that contractors must apply for electronic payments on a contract-by-contract basis, instead of one time. This is a burden for contractors and DoD. Second, current regulation requires payment of one contract at a time, not permitting payments to be consolidated for the same contractor. Many contractors have requested payment by Commercial and Government Entity (CAGE) codes instead of by individual contracts (i.e., multiple invoices paid to the same contractor under a single CAGE code). The final issue involves electronic signature standards, which are having a significant impact on the implementation of EDI applications. Electronic signatures are essentially coded transmissions unique to the sender and receiver that identify the sender or receiver as the approval authority for a transaction (such as an invoice). While electronic signatures are legally accepted, there is

uncertainty over the electronic signature standard to be used which has created problems for activities implementing EDI.

a. "Signing up" for Electronic Payments.

Although the FAR specifically authorizes the use of EFT for contract payments [Ref. 65: para 52.232-28], many contractors were under the perception that once they signed on for electronic payments, it would cover all their contracts. The current regulation [Ref 65: para. 32.908(d)] requires that an EFT clause be placed in each contract. The standard EFT clause is provided for in FAR part 52.232-28. The requirement to update EFT agreements for each new contract has become a time consuming process in the DFAS-Columbus Center electronic payments office. In the event of older (non-EFT) contracts, a contract modification is required to convert those non-EFT contracts to EFT. According to the DFAS-Columbus Center EFT office, this creates a great deal of frustration for the contractor and adds significantly to the workload for DFAS. EFT authorization must be entered onto MOCAS for each contract, not just each contractor [Ref. 50.]. To simplify the process, the EFT authorization has been reduced to a single document, Standard Form 3881 (Payment Information Form - ACH Vendor Payment System) or an equivalent document provided by the contractor.

b. Payment by Commercial and Government Entity (CAGE) Code.

The issue of payment by contract number or by CAGE code is not a new issue. It has received more attention with the implementation of electronic payments because it would simplify payments for many contractors. The CAGE code is a five digit code assigned to commercial

activities based upon plant/office location. Corporations with multiple plants have a separate CAGE code for each site. Authorizing payment by CAGE code would permit the contractor to sign up for EFT payments once and receive EFT payments for every contract assigned to that CAGE code. While a contractor may receive a "lump sum" EFT payment for multiple invoices, the remittance data accompanying the payment provide the necessary information to distinguish between payments.

There is an upcoming revision to the FAR (due out in June or July of 1993) which should resolve both the CAGE code issue and the EFT clause issue. The revised FAR will eliminate the requirement for a contract clause specifying EFT as the payment method. In addition, payment by CAGE code vice contract number will be optional [Ref. 86]. The FAR revision will not affect older contracts, which will still require a contract modification to convert to EFT [Ref. 86]. The estimated savings by converting to CAGE code payments at DFAS-Columbus Center and therefore reducing manual review and data entry of electronic payment applications exceeds $100,000 per year [Ref. 50].

c. Electronic Signatures.

The issue with respect to electronic signatures revolves around the electronic signature standard to be used within DoD. An electronic signature, to be legally authorized, must (1) be unique to the signer; (2) be capable of verification; (3) be under a signer's control; and (4) be linked to the data being transmitted [Ref. 87: pp. 3-3,4]. The Department of Commerce's National Institute of Standards and Technology (NIST), under the Computer Security Act of 1987, was

given the authority to set standards and guidelines for data security, including electronic signatures [Ref. 88: p. 2]. In December 1991, NIST gave notice of a new electronic signature standard, Digital Signal Standard (DSS), for use by the Federal Government [Ref. 89]. During the comment period before the standard would receive final authorization, the DSS standard drew a lot of criticism, thus holding up approval of the standard [Ref. 90: p. 33].

The selection of a Federal standard for electronic signatures impacts DoD EFT payment applications because the NIST standards apply to DoD. Without an agreed upon format for electronic signature, the introduction of EDI transaction sets requiring electronic signatures cannot be fully implemented. This is the case with the STARS Electronic Processing System (SEPS) project, which is awaiting an electronic signature standard for the ANSI 850 (Invoice) transaction set [Ref. 56] In the interim, the ANSI 850 transaction set is being sent, with the contractor required to retain a hard copy invoice on file [Ref. 56]. Likewise, at DFAS-Columbus Center the requirement for the contractor to submit a hard copy invoice is waived if it is using EDI. However, the contractor must retain a hard copy invoice on file as well [Ref. 83] The retention of hard copy documents in support of EDI transaction sets defeats the purpose of EDI as a "paperless" technology. Until the electronic signature issue is resolved by NIST, activities implementing electronic payment and other EDI projects must rely on the hard copy documents EDI is intended to replace.

2. Trading Partner Agreements (TPAs).

The TPA is defined as "a written instrument of understanding negotiated between EDI trading partners that specifies contractual matters and protocols of governing EDI transactions" [Ref. 36: Glossary p. 4]. Trading Partner Agreements may cover EDI and/or electronic payment transactions (known specifically as electronic payment agreements) and may be incorporated into the contract or agreed upon separately. While there is no legal requirement for a TPA, it is required by the DoD EDI Implementation Guidelines [Ref. 4: para. 3.6].

TPAs lay the foundation for data exchanges between the Government and private industry. Since the open transmission of electronic data between contractor and Government is a relatively new concept, a comparison of four trading partner agreements was made. The American Bar Association's (ABA) Model Electronic Payments Agreement [Ref. 91], TPAs from DFAS-Columbus Center [Ref. 92], DFAS-Cleveland (STARS/SEPS Agreement) [Ref 93], and ASO Philadelphia [Ref 94] were compared. Because of the interest by the ABA in TPAs, private industry is likely to increase its attention to TPA content. This prompted the comparison of the ABA model agreement with those within DoD.

a. Similarities of TPAs.

The following list identifies some of the characteristics of TPAs identical to all four model agreements identified above:

- A TPA is a legally binding agreement.
- TPA transactions must provide the same information as paper transactions.

- A functional acknowledgement (i.e., notification from the receiving activity to the sending activity that the transmission was received) is required between parties.

- A trading partner has the right to terminate a TPA if the other party fails to comply with the terms of the agreement.

- "Adequate Security" is required. The TPAs reviewed did not specify what adequate security implied, except that it be agreed upon between parties. [Refs 91-94]

TPA agreements will specify the terms of the agreement (i.e., transaction sets involved, communication protocols, etc.). Each TPA is structured to meet the requirements of the two parties; therefore each is unique. The common characteristics listed above identify areas of consensus on TPA content.

b. Dissimilarities between TPAs.

There are some notable differences between the model TPA agreements, including the following:

- Transmission receipt. The DFAS model states that a transaction is received into the receivers electronic mailbox. The ABA model says receipt occurs when the transaction is "accessible". The ASO or SEPS model do not specify when transmission receipt occurs. [Refs. 91-94]

- Transmission acceptance. Only the ASO model agreement specifies a specific time that the receiving activity must review and collect its transactions [Ref. 94]

- Third party liability. Third party activities (i.e., Value Added Networks, or VANs) are addressed quite differently. The ASO model requires any VAN agreement to be incorporated into the TPA as an appendix. The DFAS model discusses third party costs only. The ABA model states that each party is liable for errors or omissions of its third party (including bank). The SEPS model does not address third parties. [Refs. 91, 92, 94]

- Incorporation by reference. Only the DFAS model incorporates specific laws and regulations that impact the TPA simply by referring to them (such as the Code of Federal Regulations, FAR, and DFARS). The other models do not address regulatory constraints. [Ref. 92]

These examples highlight just a few of the differences between TPA agreements. Although all of the models have some similarities, there is no standard format for DoD TPA's. While the DoD Implementation Guidelines for Electronic Data Interchange provide a listing of general topics that a typical TPA should address [Ref. 4: para 3.6], they do not specifically address electronic payments. The ABA model goes into great detail on obligations of the parties, receipt, liability and confidentiality issues [Ref 91]. The use of TPAs is expected to expand and their complexity increase in the coming years, as new trading partners and EDI applications become available. The increased involvement of the legal community (as the ABA Model Payment Agreement demonstrates) indicates that the Government and private sector will be increasingly concerned about TPA content. The ABA Model Payment Agreement should be considered for its possible application to DoD electronic payment models. DoD activities may be able to improve upon their electronic payment agreements by incorporating the ABA model into their own agreements.

3. Competition for Bank Electronic Payment Services.

The issue of competition for ACH services between the Federal Reserve Bank and private banking was introduced in Chapter II, with discussion of the Monetary Control Act of 1980. The 1980 Act opened the door to competitors for ACH and other electronic banking services, while

requiring the FRB to charge for its services. Examined here is the fact that current Federal regulations preclude the Federal Government from seeking competition for bank services.

Federal agencies are required to use the Federal Reserve Systems's ACH payment system for electronic payments, as cited in the FAR and the Code of Federal Regulations (CFR) [Ref. 19 p. 11-21, Ref. 65 para. 52-232-28]. For contract payments, this is marketed under the U.S. Treasury's Vendor Express program. Interviews (Ms. Glenda Brown (DFAS-Columbus), Ms. Vicki Beck (DFAS-Cleveland), and Mr. Jeff Noble (formerly with DFAS-Columbus)) indicated that, as a Federal agency, DoD does not pay for these ACH services (if DoD does reimburse the Federal Reserve for ACH services, it was not apparent through this study) [Refs. 50, 57, 95.]. This may be viewed as an obstacle to competition for ACH services.

Chapter II identified Value Added Banks (VAB's) as banks that specialize in electronic payment services. Because electronic payments require high volume to make the EDI investment worthwhile (in hardware, software, communication links, and training) [Ref. 24 p. 26, ref. 95], the larger commercial banks are the most likely to become competitors for electronic payment services. Conceivably, these commercial banks can provide the same ACH services to Federal agencies that the FRS does today. Because the VAB segment of the banking industry is relatively new and because Federal agencies cannot seek competition for electronic payment services, due to regulatory restrictions, this opportunity has not been explored. Because DoD is not charged for its ACH services, it

does not need to consider other potential service providers for electronic payments. As the private banking industry continues to expand electronic payment services, it conceivably could provide a reasonable cost alternative to the FRS system, if regulatory restrictions could be lifted.

4. Cash Management and "Float" Issues.

The issues of cash management and float are brought up because they are significant issues for private industry (as the contractor survey will reveal). Improved cash management is seen as one of the strong selling points for electronic payments. The Federal Governments' cash management policy will be discussed to see if it is consistent with the benefits that private industry can achieve. The "float" issue is often cited as an obstacle to electronic payments because it is seen as a benefit to the paying organization. Indeed, entire electronic payment systems rely upon the "float". For example, banks routinely exceed ("float") their Federal Reserve account limits each day in what is referred to as "daylight overdrafts" [Ref. 96: p. 199]. Many businesses have not gotten involved with electronic payments for fear of losing the "float" they receive from issuing check payments. Float will be examined to see how private industry and DoD are capable of dealing with the issue.

a. Cash Management.

Cash management refers to an organization's ability to make sound financial decisions with its working capital. Electronic payments can greatly enhance an organization's ability to manage cash by

providing almost immediate information on cash balances, and, thus, permitting timely investment decisions. With the proper application of EFT and EDI as a business strategy, an organization can achieve competitive advantage in the market place [Ref. 97]. As the contractor survey will reveal, receiving proper electronic payment information is necessary for an effective cash management program.

In the area of Federal Government contract payments, cash management takes on a different perspective. Following the guidance of the Prompt Payment Act and Office of Management and Budget Circular A-125, the FAR states the following:

> Invoice payments and contract financing payments will be made by the Government as close as possible to (or earlier as determined by the Agency head to be necessary on a case-by-case basis), but not later than the due dates specified in the contract.... [Ref. 65: para 32.903]

At DFAS-Columbus Center, the "typical" net 30 invoice payment is processed for release (payment) 23 days after receipt date. The payment date is the same for both check and electronic payment. Because of Prompt Payment considerations (i.e., interest penalties for late invoice payments or improperly taken discounts [Ref. 65: para. 32-903]), DFAS-Columbus Center chooses to pay a few days earlier to ensure payment is received by the contractor on time.

Conceivably, DFAS-Columbus Center could better utilize its electronic payment capabilities to improve its cash flow. Since electronic payments will automatically be received the following day (day 24), DFAS-Columbus Center could defer its electronic payment date

to day 28 or 29 of the net 30 pay period, allowing DFAS to retain Government funds until later in the pay cycle.

There are obstacles to changing the electronic payment processing cycle. First, the CAS directorates do not identify invoices as either EFT or check payments; both are processed in the same way and delivered to Cash Management on day 23 [Ref. 50]. In order to defer the electronic payment dates, the CAS directorate would require some means of distinguishing between electronic payments and check payments. Second, DFAS-Columbus Center must weigh the cash flow benefits of holding payments until later in the cycle with the perception of the Federal Government as a delinquent payer. Delaying the payment date for electronic payments may be possible, but it may not be well received.

b. Float.

By speeding up the payment process, electronic payments are usually identified as benefiting the receiver, not the payer. As the survey results will reveal, while there is ready acceptance of electronic payment processes for accounts receivable, this is not the case with accounts payable. One of the reasons is "float". Float is defined as "...the time period between when a payment is tendered and when investible (sic) funds are made available to the payee." [Ref. 98: p. 51] Float has long been recognized as a cash management tool used by financial managers to invest "borrowed" funds, i.e., those funds disbursed by check but not yet received by the payee. With the advent of electronic payments, private industry has recognized that the paying activity will lose 1 to 2 days of float. One recommendation suggested

to private industry is to offset the loss of float by negotiating float into the contract price or the payment terms [Ref. 99: p. 16]. For example, the value of the float loss (e.g., the value of the contract payment times one or two days of interest) can be backed out of the price from the supplier to offset the loss of float. Another alternative would be to increase the electronic payment period (e.g., net 32 days vice net 30 for check).

While the concept of offsetting float loss through negotiating electronic payments into the terms of the contract is relatively straighforward for private industry, it is not so with DoD. The FAR is very specific on invoice payment dates [Ref. 65: para 32.905], and discourages due date changes. Decreasing the cost of the contractor payment by the value of Government float loss is also a risky venture. This would require an agreement between the contractor and the Government on price and interest rate to be used to calculate the value of the float loss. From a buying office perspective, this could be a relatively minute amount, and divert contract negotiations away from more substantive issues.

Perhaps the most persuasive argument against making float loss an issue is that DoD is trying to encourage contractors to receive payments electronically, which decreases DoD's cost of processing the payment (as stated earlier, approximately three dollars per payment [Ref. 50]). Negotiating float would discourage contractors from signing up for electronic payments. Given the visibility of the Prompt Payment Act and the Government's poor record in making payments on time, any

attempt by the Government to negotiate its loss of float would be counterproductive.

5. Factors Influencing DFAS-Columbus Center's Electronic Payment Process.

This section will describe two factors influencing electronic payments at DFAS-Columbus Center, Federal Reserve Bank deadlines and "EFT Rejects". Both of these factors can put a strain on DFAS's electronic payment process.

a. Federal Reserve Bank (FRB) Deadlines.

The transmission of electronic payment information to the FRB is under a tight daily schedule. The implementation of NACHA's "all-electronic ACH" policy, to go into effect by 1 July 1993 [Ref. 18: p. 22], may strain the daily electronic payment schedule even further. To better understand how the "all-electronic ACH" might influence the DFAS schedule, a brief summary of the DFAS-Columbus Center disbursement process will be provided.

Referring back to Figure 13 in Chapter II, the disbursement function is the final step in the payment process at DFAS-Columbus Center. Each day five separate electronic payment tapes are generated on the MOCAS EFT Module (one for each CAS Directorate) The disbursing office payment totals must match the totals at the central MOCAS data processing center (located at the Defense Information Technology Services Organization, DITSO, in Columbus, Ohio). If they do not match, erroneous or problematic payments must be deleted by the disbursing office before the tape is transmitted. There is a daily deadline of

1300 at the FRB for receipt of the electronic pay transmissions. However, "late" transmissions will be accepted by the FRB up until 2300 [Ref. 100]. Between these two deadlines is a daily DITSO data processing deadline of 1900. If a problem occurs, DFAS will process those tapes that are correct and edit the remaining tape(s). Should the tape correction process go beyond 1900, the electronic payment tape is sent by courier to the FRB Cleveland (Columbus Office) before the 2300 deadline [Ref. 100].

The issue here regards the "all electronic ACH" mandate. Once the mandate goes into effect, the FRB may reject the late courier deliveries of electronic payment transactions, or it may decide to accept them (possibly assessing a stiff fee for manual processing). Given the author's observation that DFAS-Columbus Center does not pay for its ACH services at the FRB, it is unclear whether any "late fee" would be assessed to DFAS at all. If DFAS-Columbus Center continues to rely on courier delivery after the all-electronic mandate goes into effect, this may undermine the all-electronic ACH effort at the FRB.

As Oliver [Ref. 18] pointed out, one of the benefits of an all electronic ACH may be deferring the ACH deposit deadline to later into the evening. If so, this may help DFAS-Columbus Center meet its FRB deadline, but it still has the DITSO data processing deadline of 1900 to meet. Until the "all-electronic ACH" takes effect on 1 July 1993, its full impact on DFAS may not be known.

b. EFT Rejects.

The NACHA rules provide specific guidance to ACH network participants in the event an EFT transaction is rejected [Ref. 9]. One of the common reasons for an EFT reject is that the bank account number is wrong or the account had been closed [Ref. 100]. EFT rejects are raised as an issue here because, once an electronic pay transaction is rejected, it sets in motion a chain of events requiring very labor intensive efforts to correct the problem. The following steps describe the process:

- The FRB sends an automated ACH entry register on a daily basis to DFAS-Columbus Center. On the register are ACH payment rejection notices. The rejection notice provides the associated payment information about the "rejected" company. It also advises DFAS that the DoD account has been credited by the amount of the rejected payment. The FRB will manually process a deposit ticket (SF 215) and public voucher (SF 1049) to document the credit, and mail a copy of each to DFAS, separate from the ACH register (and usually later).

- Upon initial notification of the EFT reject, DFAS-Columbus Center will manually process a check and mail it to the contractor for the amount of the EFT reject. This rapid turnaround is necessary to stay in compliance with the Prompt Payment Act.

- The EFT payment office is notified of the EFT reject, and immediately suspends the contractor from further EFT payments in the MOCAS system until the problem is resolved.

- The deposit ticket and public voucher are received from the FRB. DFAS-Columbus Center manually prepares a collection voucher (DD 1131) to record the deposit, thus balancing out the check payment and the FRB deposit ticket.

Two points need to be made about this process. First, the more obvious observation is that it is a very labor-intensive effort to correct an

EFT reject. Not only does DFAS apply a lot of manpower to resolve the issue, it also is a time-consuming function at the FRB. Second, because of the time delay in receiving notification of an EFT reject by mail, it is conceivable that several EFT payments to that same company could be made before DFAS has an opportunity to suspend EFT payments. As a result, the labor-intensive effort described above could be repeated several times because of the lag in notification time.

One avenue that DFAS-Columbus Center will be taking in the spring of 1993 that may shorten the receipt time for EFT reject notification is through the use of the Fedline (communications link) system. Fedline is being installed to transmit accounting information between the FRB and DFAS-Columbus Center [Ref. 50]. Conceivably, the FRB should be able to transmit the EFT reject notices to DFAS, thus permitting a rapid response to EFT reject problems. The FRB-DFAS Fedline link is still under legal review at both the FRB and DFAS [Ref. 86].

C. DoD PAYMENT/ACCOUNTING CYCLE ISSUES AFFECTING ELECTRONIC PAYMENTS.

Throughout this study the observation that payment and accounting functions within DoD are virtually inseparable has been stressed. One of the major benefits of visiting several DoD activities has been gaining a better understanding of the criticality of the payment/accounting link. Without an accurate payment system linked to an accurate accounting system, innovations such as electronic payments will yield only marginal benefits at best.

Because DoD has many different payment and accounting systems (some introduced in Chapter II) with their own unique problems, it would be unrealistic to try to identify all of the issues. The focus here will be on an examination of pay and accounting issues from two perspectives, DFAS-Columbus Center (Payment Office) and ASO Philadelphia (buying office, AAA, ICP).

1. Pay/Accounting Issues from a DFAS-Columbus Center Perspective.

In Chapter II the observation was made that a payment office requires complete, accurate information to perform its payment mission. In this section some of the impediments to achieving that mission will be discussed.

a. Accurate Contract/Contract Modifications.

When an invoice is received at DFAS-Columbus Center, it needs the supporting contract documentation on hand before payment approval can take place. A fairly routine problem is receiving a copy of the current contract or contract modification before the invoice is received. The distribution time on contracts can be lengthy, sometimes as long as two to three weeks for contract modifications. Meanwhile the contractor, with his copy of contract (or contract modification) in hand, can begin submitting invoices immediately. Although the contractor may submit a copy of the contract or contract modification along with its invoice, DFAS cannot use it, since it can accept a contract only from another Government activity [Ref. 101]. As a result, there can be a significant lag between the time that an invoice is

received and the necessary documentation is available to process the payment.

There can be problems with the contracts that are received. If a contract is misrouted to the wrong CAS Directorate or entered onto the wrong MOCAS database (five databases, one for each Directorate), it must be internally rerouted to the correct Directorate. This can add seven to ten days delay in processing an invoice for payment [Ref. 102]. Another problem that can occur is that a contract modification may increase the obligational authority on a contract, such as an increase in funding to pay for increased contract line item (CLIN) prices. If the contract modification does not specifically identify which CLIN's have had their prices changed, then the CLIN prices on the contractor's invoice will not match the CLIN prices on DFAS's copy of the contract. As a result, there is a unit price discrepancy between the original contract price and the modified contract price [Ref. 102], which will require clarification or correction.

Contract modifications may cite the wrong appropriation or payment office, have missing or incomplete data, or it may be written improperly so that they cannot be entered into MOCAS [Ref. 101]. A DD form 1716, Contract Data Package Recommendation/Deficiency Report may need to be sent from DFAS to the Administrative Contracting Officer (ACO) or the Procurement Contracting Officer (PCO) to clarify the deficiency. As one CAS directorate division chief put it, she must send out "tons of 1716s for clarifications" before many invoices can be paid [Ref. 101].

The problems involving contracts raise an issue that many interviewees throughout this study have brought up, the need for a standardized format for contract modifications throughout DoD. Many of the clarification problems identified above could be eliminated if contract modifications were written in a format easily transferrable into MOCAS. This is apparently an old issue that does not have a strong enough consensus to achieve a resolution. [Ref. 45.]

b. Available Obligational Authority.

DFAS-Columbus Center legally can only make payments citing appropriations that have sufficient obligational authority (i.e., funds) remaining. It is a violation of 31 U.S. Code 1517 (commonly referred to as a 1517 violation) to overobligate funds [Ref. 103: p. A-22]. A significant portion of the overage invoices at DFAS-Columbus Center are due to insufficient obligation authority [Ref. 104]. In some cases the delay involves cost reimbursement vouchers for cost-type contracts. Because of backlogs on approving contractor overhead rates at the Defense Contract Audit Agency (DCAA), once the rates are approved there may not be sufficient funds remaining. Those cost reimbursement vouchers must then await approval of new funding before payment can be made [Ref. 104]. In a related problem, invoices which have charged appropriations that have lapsed (i.e., disbursements can no longer be made against them) cannot legally cite the original appropriation, and must be paid out of the successor "M" account [Ref 104]. These invoices are problematic because the activity that funded the original appropriation (which has since lapsed) must now identify "M" account

funds to pay those invoices. The "M" account must be liquidated by the end of Fiscal Year 1993 by DoD directive [Ref. 103, p. A-19; Ref. 104]. Consequently, those overage invoices citing "M" account appropriations will eventually go away.

Invoices for Foreign Military Sales (FMS) likewise create problems for DFAS-Columbus Center. FMS invoice payments require a special authorization before payment can be made, and they often lack obligational authority [Refs. 100, 104]. According to the DFAS-Columbus Center disbursing office, approximately 85 to 90 percent of the payments that require deletion from the MOCAS electronic payment tapes are for FMS invoices that lack sufficient funding [Ref. 104]. One of the reasons that FMS payments are not processed separately is that the DFAS Cash Management Office cannot distinguish between an FMS payment and a routine invoice payment [Ref. 104]. Although FMS payments make up a small portion of the overall volume at DFAS-Columbus Center, their unique requirements routinely disrupt the payment cycle.

c. Offset Payments.

On occasion DFAS-Columbus Center must assess offsets against invoice payments (e.g., Internal Revenue Service tax levys). Invoice payments requiring offset payments must be processed manually. Once the amount of the deduction is determined, the balance of the contractor's payment may be transmitted electronically [Ref. 86]. The contractor, if unaware of the offset requirement, may receive electronic payment for an invoice for an amount less than anticipated. One of the concerns about electronic payments is that there is no uniform way to report these

types of deductions electronically [Ref. 104]. As a result, invoices involving offset payments are usually paid by check vice EFT.

d. Summary of DFAS-Columbus Electronic Payment Issues.

This section addressed some of the specific issues affecting electronic payments at DFAS-Columbus Center. One factor not specifically mentioned here that has been raised as an issue earlier in this study is accuracy of data entry. Because the EDI applications that will replace manual data entry are still undergoing testing, the MOCAS system must still rely upon accurate manual data entry. Improper data entry can either delay invoice payment until corrections are made, or it can adversely affect the pay/accounting cycle later on in the process.

2. Pay/Accounting Issues from the ASO Philadelphia Perspective.

Since ASO Philadelphia performs many different functions (inventory management, accounting, and procurement) under one roof, its view of the pay/accounting cycle tends to differ from that of DFAS-Columbus Center. With the DMRD 910 consolidation of payment centers, ASO Philadelphia's role has shifted from one of self-reliance in the performance of payment functions to one of dependence on the DFAS system. Although this has created a structural change in the pay/accounting cycle, ASO's mission has not changed. What has changed has been its need to collect payment and accounting information externally (from DFAS) rather than internally. This section will address ASO's information requirements within the context of the following issues:

- Material-in-transit (MIT) information requirements.
- Undistributed disbursement corrections.
- MOCAS contract payment data query requirements.
- Capitalization under DFAS-Cleveland.
- Contract data requests from DFAS-Columbus Center.

Finally, this section will address the "culture shock" of converting from the IDA system to MOCAS for contract payment functions.

a. Material-in-Transit (MIT).

As the inventory manager for Naval Aviation repairable and consumable items, ASO Philadelphia must track material shipments in order to provide reliable logistics support. One vital source of this information is the shipment information available through the payment system. Once material is accepted at the source (contractor's plant) or destination, the shipment notice and contractor invoice can provide valuable information to an inventory manager about the number of units shipped (contract line item, or CLIN) and the ultimate destination (SUBCLIN). For those contracts being paid under ASO's IDA (G06) system (refer to Figure 11, Chapter II), this information is available through the Obligation Status File (OSF) [Ref. 45].

With the shift in payments from ASO's IDA (G06) system to DFAS-Columbus Center's MOCAS system, this information is not as easily accessible. MOCAS is structured for financial and accounting functions, which do not transfer well to the inventory management requirements of ASO. Data queries can be made by contract number, shipment number, or

CAGE code, not by part number or National Stock Number (NSN) [Ref. 53]. The IDA (G06) system is more amenable to the inventory requirements of ASO; stock numbers or part numbers can be used to perform a data query [Ref. 45]. As such, ASO can more easily manage its inventory shipments using the IDA (G06) system than the MOCAS system.

One of the problems that has affected ASO's ability to process shipment data is insufficient manpower for data entry. In accordance with the DoD FAR Supplement (DFARS), one copy of the contractor's shipment notice (DD 250 - Material Inspection and Receiving Report) is sent to the Buying Office [Ref. 46: F-401]. Because ASO does not have the manpower to enter all the shipment notice information into its IDA system, the shipment notices for those contracts paid out of DFAS are discarded [Ref. 45]. Since the same shipment information will eventually be posted by DFAS personnel on the MOCAS system, ASC waits for DFAS to perform the data entry function, saving data entry manpower [Ref. 45]. Whether this is a "systemic" problem for other buying activities is unknown. Eventually, with the expanded use of the ANSI 856 Shipment Notice (the EDI version of the DD-250), shipment information will be automatically recorded on ASO's database, resolving this problem.

b. Undistributed Disbursement Corrections.

In the Chapter II presentation of the Pay/Accounting Cycle (as summarized in he flow chart in Appendix C), the need to make corrections due to erroneous accounting data was discussed. These errors, which are reported to the AAA in the monthly CERPS download, are

referred to as undistributed disbursements. It is the AAA's responsibility to correct the accounting data so that the AAA's accounting records match the official Navy records on CERPS. The process by which undistributed disbursements are corrected can become a labor intensive and tedious research project for the AAA. At ASO, payment information from DFAS-Columbus Center is necessary to compare MOCAS account balances with the IDA account balances. At present there are no automated means of reconciling DFAS accounting records with ASO's accounting records. In addition to this problem, ASO has not (until recently) had access to the MOCAS database to extract payment data it needs to try to perform a manual reconciliation - specifically the MOCAS Contract Disbursement History Inquiry menu [Ref. 105]. Each contract account imbalance requires a historical review of payments made out of MOCAS, matched against the account balances held by the AAA (i.e., total obligation authority available, amount expended to date), matched against what the "official" CERPS system says is the correct amount.

To go into more detail on the undistributed disbursement process would be beyond the scope of this study, however it is a fair assessment to say that undistributed disbursements are a "systemic" problem with both Navy and DoD payment and accounting systems. The chance of data entry error at any step along the pay/accounting cycle is great. Also, it is important to point out that there are four sets of accounting books which must match in the process: ASO's IDA system, DFAS-Columbus Center's MOCAS system, the Navy's Financial Reporting System (FRS), and the Navy's "official" CERPS system. There is

currently an initiative underway to investigate the systemic problems which create unmatched disbursements in the Navy's accounting system and alternatives to resolve these problems.

c. Data Query Requirements from MOCAS.

The information flow between ASO and the MOCAS system is all in one direction. ASO cannot update MOCAS records nor provide input into the payment process until after payment is made. As the flow chart in Appendix C depicts, ASO presently has only limited data query capabilities. As stated earlier, data queries can only be conducted by contract number, shipment number, or CAGE code. MOCAS cannot provide a historical summary of payments for a particular NSN in a format that ASO can use [Refs 45, 53]. In addition, DFAS-Columbus Center must limit the data query capabilities of its users to prevent the system from "locking up" [Refs. 54, 105].

There are two possible avenues which may permit information to flow from ASO Philadelphia into the MOCAS system, which will be discussed below.

(1) "Trusted Agents". DFAS-Columbus Center has a program by which an individual at a DoD activity can make corrections to MOCAS data, as long as those data do not affect financial information. These "trusted agents" are typically designated procurement assistants given limited MOCAS access. DFAS-Columbus Center maintains control over trusted agents by auditing the changes they make on MOCAS [Ref. 53]. Through the use of trusted agents, corrections can be made in MOCAS

which may prevent undistributed disbursements further along in the pay/accounting cycle.

(2) Contract Payment Notice - Direct Reporting. This is currently a joint DFAS-U.S. Air Force test program which permits the buying office the ability to approve or disapprove a payment before it is sent out and reported to a Service's financial reporting system [Ref. 106]. The contract payment notice (CPN) concept is not new; it has been a process available under MILSCAP Manual 4000.25-5-M [Ref. 107]. What is new is the emphasis on rapid turnaround, before a payment is distributed and reported. Under the CPN-Direct Reporting concept, DFAS-Columbus Center generates invoice payments as usual; however, the payment is not transmitted right away. Each day a CPN report is sent to the buying activity, which has 48 hours to accept or reject the payment. Accepted payments will be mailed out (or electronically transmitted); rejected payments will be reviewed and corrected at DFAS-Columbus Center [Ref. 106]. The process is intended to stop payment errors, which will decrease the number of undistributed disbursements in the system. As a pilot project, there are issues to be resolved, such as implementation of the ANSI 568 (Contract Payment Management Report) transaction set which will be used for the CPN function [Ref. 83], and manpower requirements at DFAS-Columbus Center to handle the rejected payments [Ref. 106]. The Direct Reporting project has a 1994 target implementation date [Ref 107]. If successful, its application to the other military Services can significantly reduce the undistributed disbursement problem.

d. Capitalization of ASO's Payment Processes by DFAS-Cleveland

While the focus of this study has been with DFAS-Columbus Center's responsibility to make DoD contract payments, DFAS-Cleveland (formerly Navy Finance Center, Cleveland) is directly involved in the process, taking over payment and accounting functions for the Navy (including the STARS system). The roles which DFAS-Columbus Center and DFAS-Cleveland perform can be difficult to distinguish. Under DMRD 910, ASO Philadelphia's contract payments division was capitalized under DFAS-Cleveland (as of 07 March 1993), yet contract payments are still handled out of DFAS-Columbus Center. Simply put, both DFAS-Columbus Center and DFAS-Cleveland, Arlington Office (which operates the STARS system) can process payments. As stated in Chapter II, the funding source determines which system (MOCAS or STARS) will be used to make payment.

The payment consolidation effort by DFAS-Cleveland at ASO is going through some growing pains, as DFAS-Cleveland and ASO define areas of responsibility. One early point of conflict between them was DFAS-Cleveland's intent to leave ASO's accounting and payment function "as is, where is" [Ref. 108]. A site coordinating team (made up of former ASO personnel now assigned to DFAS-Cleveland) is trying to smooth the transition [Ref. 108]. Ultimately what may determine the success of the consolidation effort will be DFAS-Cleveland's ability to develop a better understanding of ASO's mission, understand the importance of an

integrated inventory management and accounting system, and continue improvements in the payment/accounting process.

e. Contract Data Requirements from DFAS-Columbus Center.

One of the problem areas experienced by DFAS-Columbus Center is the need for current contracts and contract modifications. Slow document distribution is not only an issue at DFAS-Columbus Center, it also affects ASO Philadelphia. ASO Philadelphia is regularly deluged with requests from DFAS-Columbus Center for copies of contracts and contract modifications [Ref. 109]. In data provided by ASO Philadelphia, DFAS-Columbus has requested copies of 691 contracts and contract modifications between October 1991 and 1 April 1993 [Ref. 109]. Requests for copies of contracts are not only time consuming for ASO Philadelphia, they should not be necessary if documents are routed properly.

Document distribution delays appear to be a contributor to the delay in invoice processing and payment. With the implementation of the ANSI 850 (purchase order) transaction set at DFAS-Columbus Center (ASO already has the ANSI 850 implemented), some of the document distribution can be eliminated.

f. The "culture shock" of converting from IDA to MOCAS.

One of the observations made at ASO Philadelphia is the concern over switching the contract payment function from the IDA system to MOCAS. Coupled with the difficulties of learning a new system are the concerns that ASO does not have sufficient access to MOCAS (as discussed earlier) and the inability to extract inventory management

information from MOCAS. Adding these concerns to problems associated with the consolidation effort, there is a concern about a loss of control, that ASO Philadelphia cannot influence the payment system as it did in the past [Ref. 80].

To help with the transfer of the payment function from ASO to DFAS-Columbus Center, the Contract Management Liason Office (CMLO) at DFAS-Columbus Center can bridge some of the issues between ASO and DFAS. The CMLO office was established by DLA to assist buying commands and contract administrative commands with problems they cannot resolve directly through DFAS [Ref. 53]. Because the CMLO is staffed by administrative contracting officers (ACO's) and DFAS is staffed primarily with accountants, financial managers, and clerks, the CMLO provides a valuable link between the finance and accounting functions at DFAS and to the contracting agencies in DoD [Ref. 53]. Part of the assistance available from the CMLO is assistance with the MOCAS databases and query functions. Support offices such as the CMLO can help ASO with the transition process as it phases out its own disbursing functions and learns the internal processes and MOCAS system at DFAS-Columbus Center.

g. Summary of Payment/Accounting Issues at ASO Philadelphia.

The consolidation of contract payment functions is creating fundamental changes in ASO's processes and organizational structure. The sense of a loss of control over the payment function, as described earlier, is a concern. Although ASO was an early developer of electronic payment functions as part of its electronic commerce program,

the consolidation effort has turned their electronic payment function into a "moct point" [Ref. 45]. The remaining issues are the accounting ones, as described above. While projects are in the works (such as DFAS-Columbus Center's CPN-Direct Reporting initiative), in the near term any improvements in the pay/accounting processes will be marginal at best.

D. DEFENSE CONTRACTOR SURVEY RESULTS.

In this section the results of the defense contractor survey will be provided. Five hundred surveys were distributed and 151 responses returned (30.2 percent response rate). One point of clarification needs to be made regarding the survey responses. Not all respondents answered every question, consequently the number of responses will vary. The number of responses to each question will be provided in the data presentation. Survey results will be provided in the following three parts:

- Background information on the respondents and their electronic payment capabilities.
- An assessment by the respondents of DFAS-Columbus Centers electronic payment services and support.
- An assessment of the electronic payment support the contractor receives from its bank.

The information is provided in both table and graph format. This section will highlight the survey questions that are the most pertinent to the study. There are additional survey results provided in Appendix

F that answer survey questions that are not critical to the study, but are provided for the reader's information.

1. Background Information on the Respondents and their Electronic Payment Capabilities.

a. Job Title Held by Respondents (Question 33).

Table 9 identifies the respondents by their respective positions. Since this question was optional, 49 of the respondents did not provide a job title. Those identified as "Other" included EDI managers, financial analysts, and various other management positions.

TABLE 9.

CLASSIFICATION OF RESPONDENTS BY JOB DESCRIPTION

Job Title	Number of Responses	Percent of Total Responses
Treasurer/Comptroller	20	13.2%
Accounting Manager	18	11.9%
"Other"	18	11.9%
President/Owner	17	11.3%
V.P. Finance/Chief Financial Officer	17	11.3%
Office/General Manager	8	5.3%
Contracts Manager	4	2.6%
Did Not Respond	49	32.5%

b. Designation as a Small or Large Business (Question 1).

Table 10 identifies the vast majority of respondents as DoD designated small businesses. One unexpected result was that many of the small businesses had sales volumes in excess of $50 million.

TABLE 10
WHICH RESPONDENTS ARE DoD DESIGNATED SMALL BUSINESSES?

Designation	Number of Responses	Percent of Total
Small Business	105	69.5%
Large Business	43	28.5%
Did not respond	3	1.9%

c. Sales Data (Questions 2 and 3).

Table 11 divides the survey population into five sales volume ranges: Zero to one million dollars in sales; one to ten million; ten to 100 million; 100 million to one billion; and over one billion in sales (Question 2). Column 4 provides the average sales for contractors in the five sales ranges. Column 5 provides the average percentage of sales to the U.S. Government (Question 3).

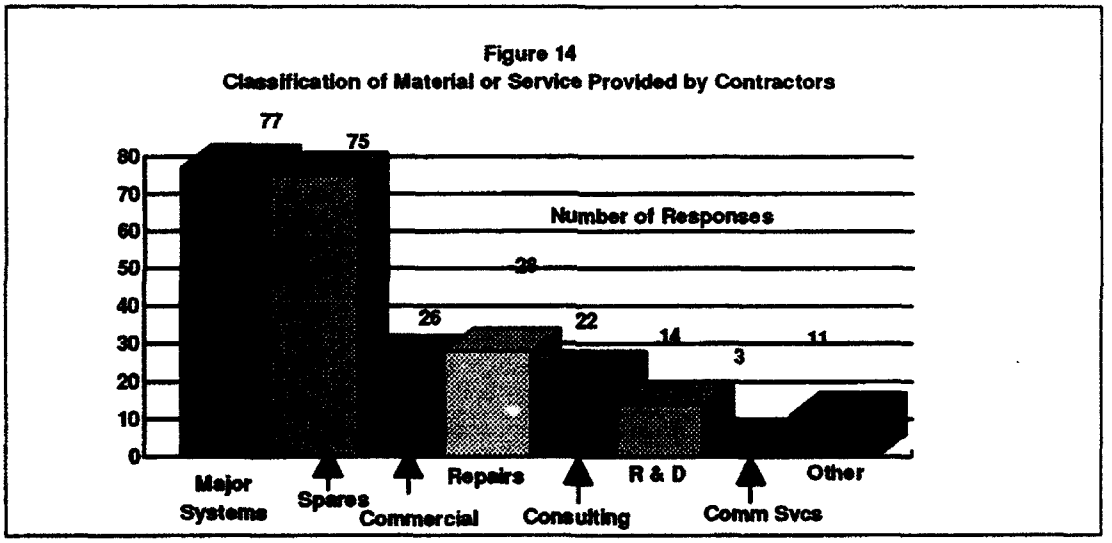
TABLE 11.

SALES VOLUME STATISTICS OF RESPONDENTS

Sales Volume ($) M=Million B=Billion	Total No. of Responses	% of Total Resp.	Avg $ Sales per Year	% Sold to Govt
0 to 1 M	28	18.6	479 K	66.3
1 to 10 M	56	37.3	3.8 M	47.5
10 to 100 Million	36	24.0	2.9 M	55.8
100 M to 1 Billion	23	15.3	283 M	54.7
Over 1 Billion	2	1.3	3.8 B	98.0
No Response	5	3.3	NA	NA

d. Classification of Material or Service Provided to the U.S. Government (Question 5).

Figure 14 identifies the type of material or service provided by the respondents. Of particular note on Figure 14 is that several respondents provide more than one service to the Federal Government, which is reflected in the diagram. "Other" types of services covered a wide range, including prepared meal packets, miscellaneous kits, etc. "Commercial" refers to commercial off-the-shelf items, whereas "Comm Svcs" includes Janitorial and Food Service type organizations.



e. Electronic Payments Usage. (Questions 6 and 8).

Table 12 identifies contractor use of electronic payments for both accounts receivable and accounts payable. It was anticipated that 100 percent of respondents would accept electronic payments because it was a DFAS electronic payment database. Several indicated that they had used electronic payments, but went back to check payments because they were easier. In response to Question 8, 96.6 percent (144 out of the

TABLE 12.

ELECTRONIC PAYMENTS USAGE

Question 6: Does your organization utilize electronic payments for Accounts Receivable?

Response	Number of Responses	% of Total
Yes	135	90.0%
No	15	10.0%

Question 8: Does your organization utilize electronic payments for Accounts Payable?

Response	Number of Responses	% of Total
Yes	5	3.4%
No	144	96.6%

149 responses) said they were not using electronic payments capabilities for their accounts payable transactions.

f. Reasons for not using electronic payments for Accounts Receivable (Questions 6A and 6B).

Table 13 summarizes the results for Question 6A. Of the 15 companies that have not implemented electronic payments for accounts

TABLE 13.

REASONS COMPANIES ARE NOT USING ELECTRONIC PAYMENTS FOR THEIR ACCOUNTS RECEIVABLE

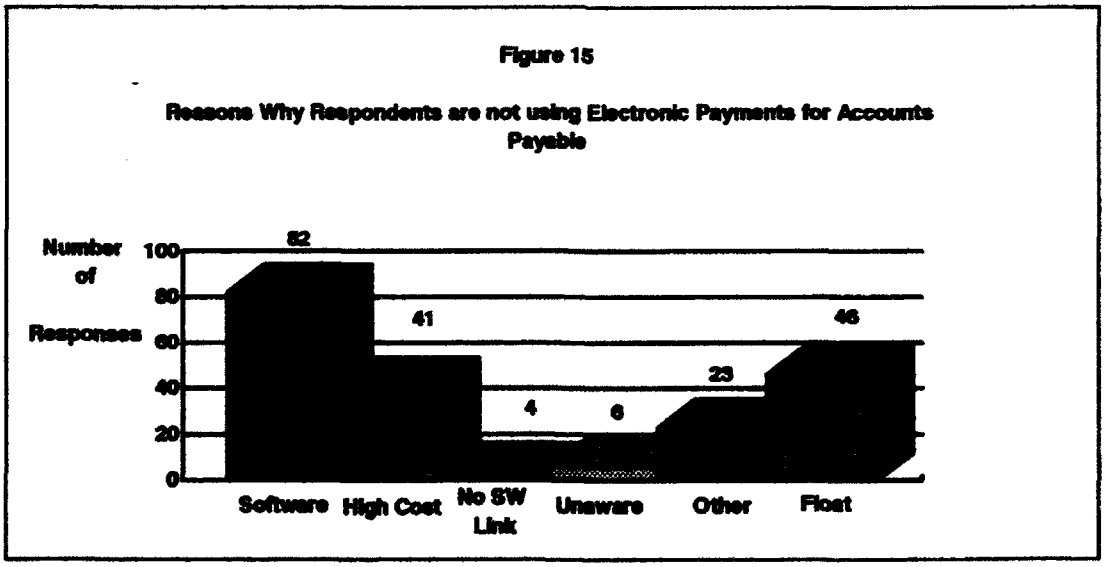
Reason Given	Number of Responses	% of Total
Prefer Checks	2	12.6%
Lack Software	6	37.5%
Late Data to Accounting	1	6.3%
Other Reasons	7	46.6%

Note: One Respondent provided two reasons

receivable, the most common reason is a lack of computer software to "bridge" electronic payment software to their in-house accounting software. One respondent indicated concern over its bank receiving payment information before its own accounting office did. Of the responses identified as "other", various reasons were cited, such as a lack of bank support, low receipt volume, and never considering electronic payments as an option. Of the 14 (out of 15) companies who responded to Question 6B, 57.1 percent indicated that they would not be implementing electronic payments for their accounts receivable.

g. Reasons for not using electronic payments for Accounts Payable (Question 8A, 8B).

Figure 15 provides a breakdown of the reasoning behind not using electronic payments for accounts payable. It is important to

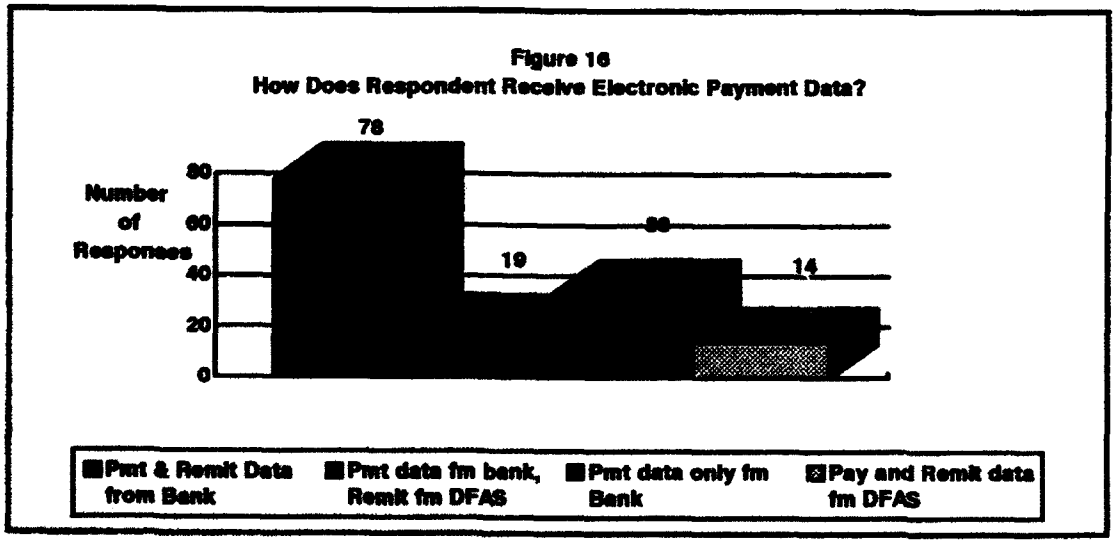


point out that many of the 144 contractors who do not use electronic payments for accounts payable cited several reasons for not using it. A lack of current software to support EFT payments was cited most often.

The "float" issue (discussed earlier in this chapter) and cost were also cited as important reasons for not implementing electronic payments. The "No SW Link" category refers to those companies which have the software available, but it is not linked to their accounting systems. Six respondents said they were unaware of the option to make payments using electronic payments. In the "other" category, the reason most often given was that suppliers were not electronic payment capable. Of the 144 respondents who do not use electronic payments for accounts payable, 86 percent indicated that they had no plans for implementing it (Question 8B, 123 out of 143 responses).

h. Remittance Data received by Contractor (Question 11).

Question 11 of the survey asked the contractor's to identify the method with which they receive electronic payment and remittance data. Figure 16 displays the results. Several of the 144 respondents to this question gave multiple answers. What can be drawn from this figure is that, for most respondents, electronic payments appears to be



established properly, with most respondents (78) receiving remittance advice along with payment notification. The 33 who responded that they are receiving EFT payment notice only may have inadequate service agreements with their banks. Further analysis will be made later in this chapter to determine if these 33 respondents are satisfied with electronic payments. Those respondents who said they receive remittance data from DFAS were probably confusing check payments (for contracts not on EFT), for which remittance data are sent, and electronic payments, where remittance data (if specified in the trading partner agreement) are only sent via the bank.

i. Non-Electronic Payment Methods (Question 12).

In Table 14, several respondents indicated more than one method of receiving payment. It was observed that most of the companies using lockboxes were large businesses, with sales exceeding 100 million.

TABLE 14.

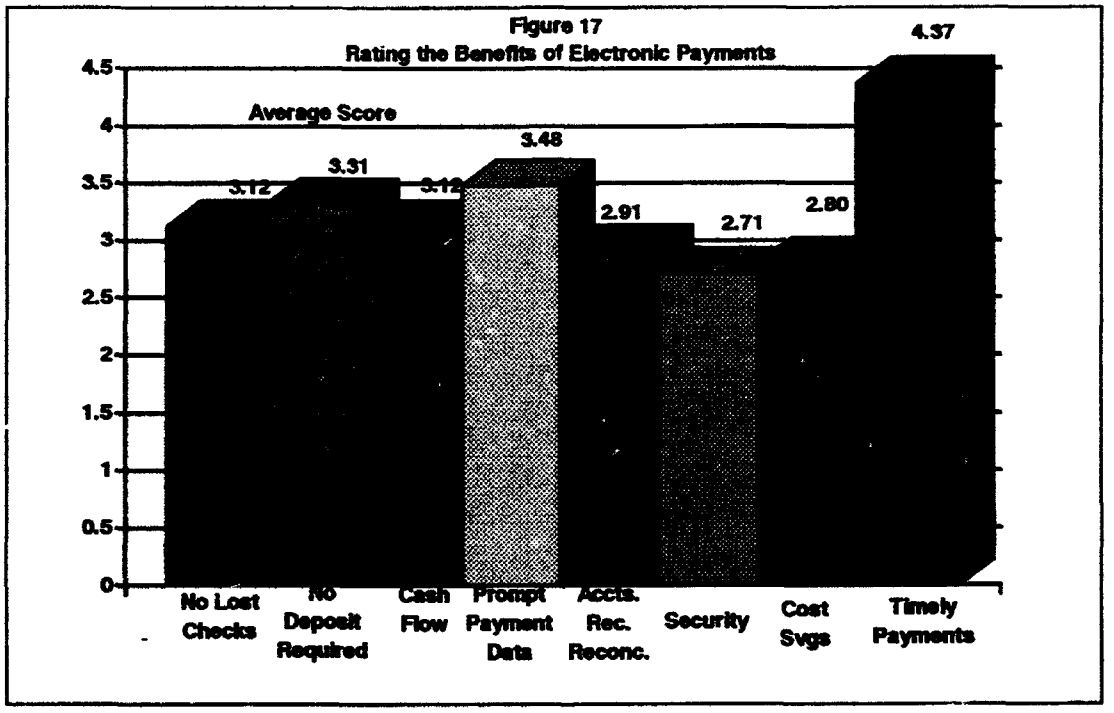
PAYMENT METHOD USED PRIOR TO ELECTRONIC PAYMENTS

Payment Mode	Number of Responses	% of Total Responses
Check via Mail	105	68.2%
Check via lockbox	48	31.2%
Courier	1	0.6%

j. Rating the Benefits of Electronic Payments (Question 14).

Each contractor was asked to rate the benefits of electronic payments on a scale from 1 (least important) to 5 (most important). The results were tallied, providing an average score for each benefit. As Figure 17 reveals, timely payments were cited as the most important

benefit associated with electronic payments. The column indicating "Cash Flow Mgmt." refers to the ability to better manage cash flow using electronic payments. This category came in a distant second in the ratings.

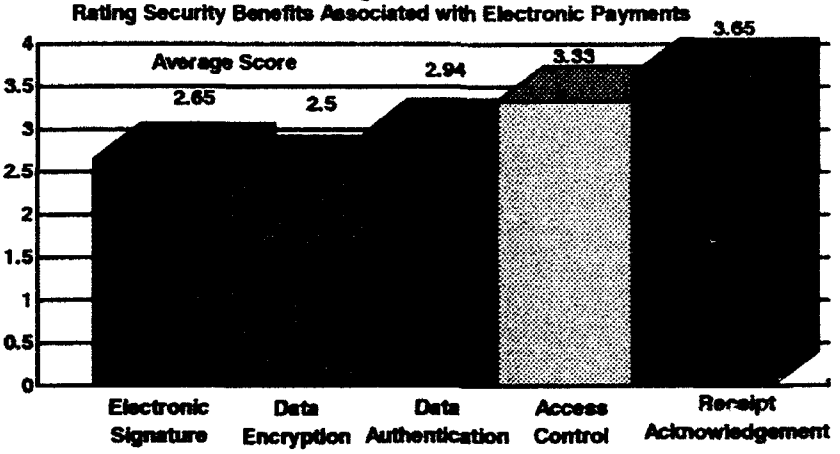


k. Evaluating Security Measures Associated with Electronic Payments (Question 29).

A similar question breaks down the security benefits associated with electronic payments into five categories. The contractor was asked to rate the importance of each of the five security measures. As with Figure 17, the contractor could give a rating from 1 (least important) to 5 (most important). There were 104 responses to this question. Cumulative scores were tallied and averaged. Figure 18 provides the results. Receipt acknowledgement was determined to be

the most important security benefit of EFT; computer access control earned the next highest rating.

Figure 18
Rating Security Benefits Associated with Electronic Payments



2. An Evaluation of the Electronic Payment Services of DFAS-Columbus Center.

In this section survey results from Part II of the electronic payments contractor survey will be reported. In addition to graph and table presentations of survey results, some of the contractor comments in response to some of the survey questions will be provided.

a. Late Contract Payments from DoD (Question 15).

Table 15 offers a subjective look at how contractors feel DoD is doing in paying them on time. There were 139 responses to question 15. It needs to be pointed out that the contractor's interpretation of "late" may not be the same as what the Prompt Payment Act defines as being late. The intent of Table 15 is to observe, from a contractor's is doing in paying them on time. There were 139 responses to question 15. It needs to be pointed out that the contractor's interpretation of

"late" may not be the same as what the Prompt Payment Act defines as being late. The intent of Table 15 is to observe, from a contractor's perspective, how well DoD is doing in paying its bills on time.

TABLE 15.

WHAT PERCENTAGE OF DoD CONTRACT PAYMENTS WERE RECEIVED LATE IN FY 1992?

% of Payments Received Late	Number of Responses	% of Total
None	20	14.4%
Less than 10%	54	38.8%
Between 10-25%	33	23.7%
Between 25-50%	17	12.2%
Over 50% Late	15	10.8%

b. Invoice Processing Time at DFAS-Columbus Center (Question 16).

Table 16 reveals that about half of the respondents feel that their invoices are being processed faster since the implementation of EFT.

TABLE 16.

ARE INVOICES BEING PROCESSED FASTER SINCE IMPLEMENTING ELECTRONIC PAYMENTS?

Response	Number of Responses	% of Total Responses
Yes	77	52.0%
No	50	33.8%
Don't Know	21	14.3%

c. Erroneous Payments from DFAS-Columbus Center (Question 18).

While Table 17 provides a snapshot of the "quality" of payments issued from DFAS-Columbus Center, it does not provide any indication of the size of the payment errors (i.e., differences in pennies or thousands of dollars), or whether the payment differences were justified (i.e., IRS tax levies). What it does reveal is the perception that errors in payments still occur whether payments are made electronically on not.

TABLE 17.

HAVE THE NUMBER OF ERRONEOUS PAYMENTS BEEN REDUCED SINCE USING ELECTRONIC PAYMENTS?

Response	Number of Responses	% of Total Responses
No	69	46.6%
Yes	49	33.1%
Don't Know	30	20.3%

d. Matching Payments to Remittance Data (Question 19).

Table 18 reveals a significant finding of this study. Unexpectedly, almost two thirds of the respondents find it more

TABLE 18.

IS THE MATCHING OF PAYMENTS TO REMITTANCE DATA EASIER WITH ELECTRONIC PAYMENTS?

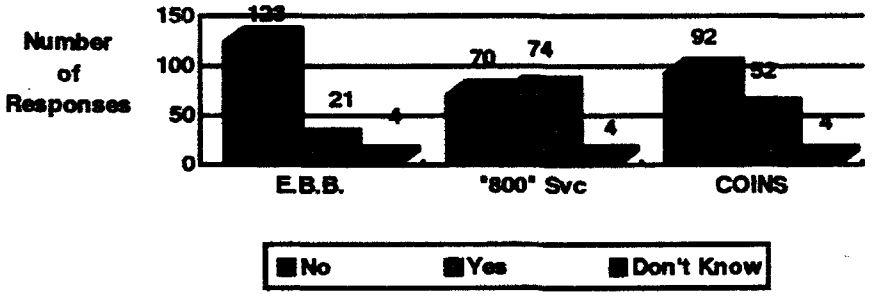
Response	Number of Responses	% of Total Responses
No	92	62.6%
Yes	32	21.8%
Don't Know	23	15.6%

difficult to match their invoice data with the bank's payment data. A further observation can be made regarding those contractors who are currently only receiving EFT payment data from their bank (Question 11c, Figure 11). When comparing these 33 contractors to those who are experiencing difficulty matching remittance data, 84.8 percent (28 out of 33 contractors) of those receiving only EFT payment notices are experiencing difficulty. Later in this study the importance of the bank/contractor relationship will be discussed further.

e. Evaluating DFAS-Columbus Center's Customer Services (Question 20).

Question 20 of the survey permitted the contractor with an opportunity to express an opinion of DFAS-Columbus Center's responsiveness, as well as rating its three customer support services, Electronic Bulletin Board (EBB), the toll free 800 service, and the Contractor-Inquiry System (COINS). Some of the more descriptive remarks made by the contractors will be mentioned here, with others provided in Appendix F. Figure 19 provides a summary of the DFAS services used by the contractor. In general, the Electronic Bulletin Board has not been used by the contractors for payment tracking; the majority of comments were directed at the toll free 800 service and COINS.

Figure 19
DFAS-Columbus Center Payment Service Usage by Defense Contractors



The following comments regarding the COINS system are provided (Question 20b):

- (COINS system): COINS is very beneficial - can check on the status of any invoice paid by DFAS - can see when payment will be released, or explanation why payment has not been released.
- (COINS system): With COINS system we are able to identify errors before checks are written & can check status of invoices prior to their net 30 payment date.
- (COINS system): COINS is an excellent tool to track the current status of invoices in the DFAS system as well as assisting us in the forecast of cash receipts.
- (COINS system): Very beneficial when COINS is working. There are still some problems with the system and especially with DFAS data inputs to the system.
- (COINS system): COINS is very beneficial due to purchase of software package to manipulate the COINS data download. Poor customer service responses from DFAS make it mandatory.

In general, the COINS system has been well accepted by contractors, with the vast majority of respondents finding its information quite useful. Among the most noted benefits of COINS are the ability to track invoice

payment status without the need to make a telephone call to DFAS-Customer Services, and the ability to identify problem invoices early.

The following comments were provided regarding the toll free 800 service:

- (800 number): By calling I am able to ascertain the status of invoices and take corrective action when necessary.
- (800 number): Very beneficial in associating payments to outstanding invoices.
- (800 number): Poor-Poor-Poor-Poor; do not return calls. If invoice is not paid automatically, you wait 3 months or more.
- (800 number): Use of the 800 number has been futile. We have gone through 8 contractor relations persons in 7 months. Management is unresponsive to our needs/concerns. To date the situation has been elevated to a Commander at our local DCMAO.
- (800 number): No one ever answers, and when they do, no one ever gets back to us.
- (800 number): Toll free 800 number has been useful in checking the status of invoices, however there have been instances when the DFAS representative does not return our calls.

The feedback on the toll free 800 service has been mixed. Perhaps the most frequently cited complaint about the service is that the DFAS customer service representative does not follow up with the contractor. For those who do get prompt responses, the service appears to be well accepted.

f. Overall Responsiveness of DFAS-Columbus Center (Question 20c).

As indicated by Table 19, the majority of contractors feel that DFAS is responsive to their needs. The following is a sampling of the

TABLE 19.

HAS DFAS-COLUMBUS BEEN RESPONSIVE TO YOUR PAYMENT ISSUES/CONCERNS?

Response	Number of Responses	% of Total Responses
Yes	97	66.4%
No	29	19.9%
Don't Know	20	13.7%

comments the contractors made regarding this question:

- Overall good. When paperwork is in error, they are very poor on notifying for corrections.

- It takes too long to resolve problems. There is no one person to take care of invoice problems. No one knows what the other depts. do.

- Good support but the system they are working with is incapable of recovering from the minutest error!

- They have been somewhat responsive, however I find that I must continually check on those invoices that may be delayed because of mods [contract modifications] not being received at DFAS from ACO's or missing approval signatures. The delay may be a month or more before I'm notified of a problem.

- We receive excellent support from DFAS-CO support personnel.

- DFAS is always very solicitous and indicates sensitivity to our need for payment by the end of the month, but it has been necessary to begin using Fed Ex [Federal Express] to make sure vouchers are received and processed by DFAS early enough for payment by the end of the month.

- There is no one person responsible for an account/payment. It is very frustrating to deal with.

- Continued inability to gain information on access to invoice deductions [offset payments]. Repayments do not match initial deduction many times.

The final question for the contractors regarding DFAS-Columbus customer support asked "What service(s), if any, would you like to see added to improve the EFT contract payments process...?" (Question 20d). The following is a sampling of the responses:

- The FAR 52.232-28 should be changed! When I enrolled in EFT,it was a one time deal, but I have to write a letter for each contract authorizing EFT

- Wish we could depend on regular mail to expeditiously handle our vouchers so we would not have to resort to Fed Ex charges in order to assure that we are paid by the end of the month.

- We would like to see the requirements for going EFT modernized. Currently they are so paper oriented, cumbersome and administratively inept that we are discussing discontinuing EFT and resorting back to live checks.

- Implementation of a procedure to immediately notify a contractor if there is a problem with a particular invoice or an expected delay in payment rather than the contractor finding out usually one month after the initial submission of the invoice.

- We "signed up" for EFT immediately upon notification by [DFAS] that it was available. Our bank was not responsive [and] was uncooperative in furnishing data. We were also unable to find out why some invoices were paid by check [and] others by EFT. Actually, we gave up on EFT.

There were several frequently cited concerns among the contractors. The need to resubmit the request for EFT for different contracts was seen as an unnecessary burden. Many contractors indicated that they were not receiving remittance data, and requested that DFAS provide it (this issue will be analyzed in the next chapter). Most of the complaints were not directly related to EFT per se. Rather, they were directed at the slowness of invoice processing, especially when an error occurred. This is consistent with observations made throughout this study.

Overall, DFAS-Columbus Center received good reviews when invoices were trouble-free, but criticism when there are problem payments.

3. Evaluation of Bank Support for Electronic Payments.

The final section of the contractor survey asked questions about the contractor's bank, to assess what electronic payment services are being provided and to gauge the contractor's understanding of their banks services. Overall, 92.5 percent of the respondents indicated that their banks did provide electronic payment services (Question 22: 136 out of 147 responses indicated they did). The following graphs and tables will summarize the services provided by the banks.

a. Contractor Familiarity with their Bank's Electronic Payment Services (Question 23).

About half of the respondents (144 responses to this question) indicated familiarity with their banks electronic payment services. Table 20 provides the results.

TABLE 20.

ARE YOU FAMILIAR WITH THE ELECTRONIC PAYMENT/EDI SERVICES PROVIDED BY YOUR BANK?

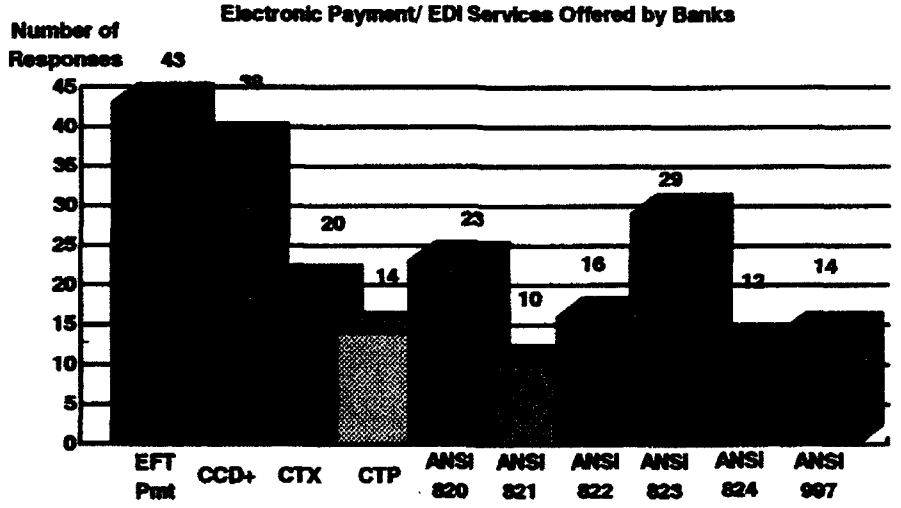
Response	Number of Responses	% of Total Responses
Yes	71	49.3%
No	63	43.8%
Don't Know	10	6.9%

b. Financial EDI/EFT Applications available from the Respondent's Bank (Question 23A).

Survey respondents who were familiar with their banks' services (the 71 who responded yes to question 23) were asked to

identify the Financial EDI and/or EFT applications that were available from their bank. Most of the respondents had difficulty trying to identify the specific ANSI X12 or ACH applications which their bank offered. Eight of the 71 respondents who said they were familiar with their banks services could not identify any electronic payment applications their bank offered. For those who were familiar with their bank electronic payment services, Figure 20 identifies the applications available.

Figure 20
Electronic Payment/ EDI Services Offered by Banks



Legend to Figure 20

EFT Payment only	EFT Payment Data Only from Bank
CCD+	Cash, Concentration and Disbursement +
CTX	Corporate Trade Exchange
CTP	Corporate Trade Payment
ANSI 820	Payment Order, Remittance Advice
ANSI 821	Financial Information Reporting
ANSI 822	Customer Account Analysis
ANSI 823	Lockbox Information
ANSI 824	Application Advice
ANSI 997	Functional Acknowledgement

The limited number of responses to Question 23A reflects a general lack of knowledge about the electronic payment applications that are in use.

c. Evaluating Bank Services (Questions 24-27).

In general, responses to questions about how the contractor's bank supported electronic payment needs reflect a lack of understanding on the part of the contractors about their banks' services. Some companies are intimately familiar with their banks' electronic payment capabilities, while most are not. In response to Question 24, 81.8 percent (117 out of 143 responses) of the contractors stated that the electronic payment services provided by their bank did not influence their decision to use that bank. Question 25 asked the contractors if their bank was competitive with other banks for electronic payment services. Only 20.1 percent (29 out of 144 responses) indicated that their banks' services were competitive; 79.2 percent (114 out of 144) did not know if their banks' services were competitive.

Table 21 reinforces a problem identified earlier (in Table 18), the difficulty 62.6 percent of contractors are having in matching

TABLE 21.

HAS YOUR ORGANIZATION ENCOUNTERED ANY PROBLEMS OBTAINING REMITTANCE DATA FROM BANK?

Response	Number of Responses	% of Total Responses
Yes	46	31.9%
No	84	58.3%
Don't Know	14	9.7%

payment information to remittance data. In Table 21, 31.9 percent of contractors claim difficulty in obtaining remittance data from their bank. Of the 46 contractors experiencing difficulty obtaining remittance data from their banks, 33 (71.7 percent) indicated that they were having trouble matching EFT payment notices to remittance data (from Table 18).

Table 22 provides an overall assessment of how the contractors' banks support their needs. Two thirds of those responding (147 total responses to Question 27) indicate that their banks support their needs.

TABLE 22.

IS YOUR BANK RESPONSIVE TO YOUR ELECTRONIC PAYMENT NEEDS?

Response	Number of Responses	% of Total Responses
Yes	97	66.0%
No	40	27.2%
Don't Know	10	6.8%

4. Volume of Electronic Payment Transactions (Question 4).

One portion of survey data that has been excluded from this discussion thus far has been the volume of electronic payments and receipts generated on average per month (Question 4). It was anticipated that the sales volume of a company would show a strong correlation to the volume of electronic payments or receipts. This was not the case.

A regression analysis was performed to try to find some correlation between transaction volume and sales. Table 23 provides a

brief summary of the results. Because of the wide standard deviation for sales ($46,242,664/month), receipts (37,790/month), and payments (1,325/month), the regression analysis could not identify any correlation. There were some data points that appeared as outliers (i.e., erroneous survey responses). However, removing these data points did not improve the results. It was observed that many high sales volume companies issue only a few payments per month, whereas many low sales volume companies issue thousands of payments or receipts per month. There is no correlation in the data from this survey.

TABLE 23.

REGRESSION ANALYSIS SUMMARY

Correlation between Sales/mo and Receipts/mo	Correlation between Sales/mo and Payments/mo
Standard Deviation, Sales/mo: $45,833,333	
Std. Dev., Recpts/mo: 37,790	Std. Dev., Pmts/mo: 1,325
Regression Equation: Sales = $110,000,000 - 202.8(receipts/mo)	Regression Equation: Sales = $86,103,683 + 42,060(payments/mo)
R-squared: .00019	R-Squared: .01008
No. of observations: 145	No. of observations: 145
Std. error of estimate (sales) = $560,000,000	Std. error of estimate (sales) = $560,000,000
Std. error of Coefficient (receipts/mo) = 1227.8	Std. error of Coefficient (payments/mo) = 34,850

Several other questions were compared to see if there was any correlation in the data. Appendix F provides a brief summary of the results.

5. Summary of the Contractor Survey Results.

This survey provided an opportunity to evaluate electronic payments from a contractor's perspective. In general, most contractors possess only a limited knowledge of electronic payment applications and the services available from the banking industry. Most feel that DFAS-Columbus Center is responsive to their payment needs. However, delayed payments due to problematic invoices (or Government delay) is a serious concern.

E. SUMMARY OF THE DATA PRESENTATION.

In this chapter data collected from various sources have been provided. The objective has been to present different perspectives of electronic payments, with focus on the problems associated with them. As this chapter and prior chapters have discussed, many of the difficulties associated with electronic payments are not caused by the electronic payment process, but rather by the supporting payment and accounting systems and activities. In Chapter V an attempt will be made to draw together the information provided thus far and assess DoD's electronic payment capabilities as it exists today.

CHAPTER V. ANALYSIS.

A. CHAPTER OVERVIEW.

This chapter will provide an overall assessment of the key issues associated with DoD electronic payments. Whereas Chapter II discussed the electronic payment institutions and processes, and Chapter IV identified some of the issues associated with electronic payments, this chapter will try to consolidate the issues. The chapter will be divided into three parts. In the first part, electronic payment issues will be examined from two broad perspectives. First, what are the key issues affecting electronic payments within DoD? DoD's objectives for electronic payments may differ from non-DoD activities. Second, what are the electronic payment objectives of non-DoD activities, specifically those of the contractor and the banking system? If there are differences in DoD and non-DoD objectives, how do they impact the overall effectiveness of DoD electronic payments?

The second part of the chapter will summarize the key pay/accounting process issues that adversely impact DoD's electronic payment capabilities. Given that current systems and processes will remain in place for the near term, some suggestions on how to improve the information flow within the existing systems will be offered.

In the final segment of this chapter, an overall assessment of DoD's electronic contract payment capabilities will be offered.

B. AN ASSESSMENT OF ELECTRONIC PAYMENT ISSUES.

The way DoD pays its contractors is different from any other private or public payment system; the enormous volume of payments, the multi-billion dollar values associated with some contracts, the complexity of the contracts involved, and the regulations which set strict parameters for payment, all complicate the relatively simple idea of paying invoices. By comparison, the objectives of private industry are more straightforward. Most contractors are primarily concerned with receiving proper payments on time and do not concern themselves with the effort that DoD must go through to make a payment. These disparate objectives may lead to misperceptions about what can be expected from DoD electronic payment capabilities.

1. Electronic Payments from a DoD Perspective.

At the heart of the electronic payment effort within DoD are two overall objectives, to achieve Deputy Secretary of Defense Taft's "paperless processing of all business-related transactions" [Ref. 3: p.1-1] through DoD's Electronic Commerce Program, and to save money through the consolidation of payment functions (DMRD 910). Both objectives seek to reduce costs, streamline and improve processes, and improve customer service (the "customers" being both DoD and non-DoD activities). Electronic payments provided a relatively easy, quick payback opportunity for DoD, since the banking industry's electronic payment (i.e., Automated Clearing House network) infrastructure was already well established, and the elimination of paper checks could provide a measurable cost savings.

Within DoD certain issues have evolved with the implementation of electronic payments and EDI. Revisions to the Federal Acquisition Regulation (FAR) have become necessary in order to make the issuance of electronic payments as easy as check payments. Developing a Federal electronic signature standard (still in the approval stage), which impacts several EDI applications, has created obstacles to fully implementing many of those applications. Trading Partner Agreements (TPAs) need to be established between the contractor and Government to legitimize and clearly define the electronic trading relationship.

The consolidation of contract payment functions has created a significant amount of upheaval within DoD, as might be expected, and requires many changes across DoD activities. DFAS-Columbus Center has capitalized DoD payment offices from around the United States, greatly expanding its volume of contract payments. Other DoD activities, such as ASO Philadelphia, are phasing out their payment functions and are now relying upon DFAS to perform this mission. With the consolidation has come the requirement to learn new payment systems, such as DFAS's MOCAS system.

Although electronic payments and the DoD consolidation effort have created some new challenges and made some role changes for DoD activities, the basic process behind paying an invoice remains unchanged. Once EDI becomes fully implemented, much of the invoice payment process can be simplified through automation. Of the problems identified in this study involving electronic payments, most are relatively minor, "developmental" type problems that require procedural

changes or updating of regulations. While electronic payment represents a significant advance as a method of payment, it represents only a minor change in DoD's overall payment process.

Likewise, the consolidation of contract payment functions under DFAS changes the payment office, but not the process. Whether payment is issued by ASO Philadelphia, DFAS-Columbus Center, or another payment office is not as important as maintaining the integrity of the invoice payment process.

2. DoD Electronic Payments from a Contractor's Perspective.

The defense contractor survey reveals that the primary objectives of the contractor in connection with electronic payments are receiving payment in a timely fashion and obtaining prompt, accurate payment data (Chapter IV, Figure 17). Beyond this, survey results suggest that most contractors have only a limited knowledge about electronic payment functions and a limited understanding of their banks' roles in the process. While contractors may not require more than a cursory level of knowledge about electronic payments, a lack of understanding can lead to problems, both in dealing with DoD and with their banks.

a. Prompt, Accurate Payment Data.

The objective of receiving prompt, accurate payment data for DoD electronic payments is a problem for many contractors. In Table 18 (Chapter IV), 62.6 percent of survey respondents indicated difficulty in matching remittance data (e.g., invoice number, the contract line items shipped) to payment data (e.g., the amount deposited in the contractor's

bank account). Many of the contractors' comments expressed a need for DFAS-Columbus Center to send remittance data to the contractor, because they were not receiving the data from their banks.

Under the electronic funds transfer arrangement with DFAS-Columbus Center, remittance data for electronic payments can be sent electronically to the contractor's bank [Ref. 50]. It is up to the contractor to make arrangements with the bank for receipt of the remittance data. In Table 21 (Chapter IV), 31.9 percent of survey respondents indicated they were having difficulty in obtaining remittance data from their banks. Another 27.2 percent of respondents indicated that their banks were not responsive to their electronic payment needs (Table 27, chapter IV). Given these survey results it is not surprising that many contractors are asking DFAS for assistance.

Although most of the contractors surveyed were not having problems with their banks, the survey results cited here reveal that there is a substantial number of contractors that are not satisfied with their banks' support. While the blame for poor electronic payment support may be directed at the banking industry for not being responsive to customer's needs, it is evident from the survey that most contractor's have not put a lot of pressure on the banks to better support their needs. Less than half of the respondents said they were familiar with their banks' services (49.3 percent, Table 20, Chapter IV). Most of those who claimed knowledge about their banks' services could not easily identify the electronic payment/financial EDI applications available (Figure 20, Chapter IV). In another survey

response, the majority of contractors (79.2 percent) did not know if their banks were competitive with their electronic payment services.

Two observations can be drawn from this information. First, many contractors may have "signed on" for electronic payments from DoD without verifying that their banks could support the electronic transmission of remittance data. Since remittance data are not mailed out for electronic payments, many contractors have resorted to calling their banks for payment notification, calling DFAS-Columbus Center for information, or waiting for their monthly bank statements to arrive. The "benefit" of electronic payments to these contractors is diminished because the payment process is no longer automatic. Contractors are forced into either following up on their payments manually or, should they decide to wait for their monthly bank statements to arrive, giving up on the cash management benefits that electronic payments can offer.

A second observation is that the banking industry does not need to be responsive because banks are not being challenged by their customers to improve services. As stated in Chapter II, the paper check clearing system is well entrenched in the banking industry. Electronic payment services require investment in computer hardware, software, communications systems, and training. At present, the return on investment for expanding electronic payment and financial EDI applications does not make it a profitable short term investment for banks [Ref. 95]. Some banks have made the decision to invest heavily in electronic payment services, most notably the "value added banks" discussed earlier. These banks have the transaction volume to make

electronic payment services profitable and are carving a niche for themselves, should the demand for electronic payment services increase.

The burden for improving electronic payment services from the banking community lies with the business community. This is a point that DFAS-Columbus Center's EFT Office has stressed with its contractors [Ref. 50.]. The business community needs to demand improved electronic payment services or change to banks which do support their electronic payment needs. Until this occurs, there will be continued contractor-bank problems and electronic payment capabilities will remain diminished.

b. Timeliness of Payments.

The contractor survey identified timely payments as the most important objective that the contractor hopes to achieve through electronic payments. Since the Government is restricted in its ability to pay invoices early [Ref. 65: para 32.903], electronic payments cannot "speed up" payments to contractors, they can only speed up the information flow about payments to the contractor. Consequently, any improvement in paying invoices on time cannot come from the electronic payment process, but rather from improvements in the processing of invoices so that payments can be made on time.

Based upon survey results, DFAS-Columbus Center is still perceived as having some problems with invoice processing. Table 15 (Chapter IV) reveals that in fiscal year 1992, approximately 46.7 percent of survey respondents received 10 percent or more of their payments late. Invoice processing has been improving, as 52 percent of

respondents indicated faster invoice processing time from DFAS (Table 16, Chapter IV). Erroneous payments were still perceived as being a problem, with only one third of respondents indicating a reduction in payment errors (Table 17, Chapter IV).

3. Analysis.

It appears that DoD will achieve cost savings from implementing electronic payments (approximately three dollars savings per payment over check payments, based upon direct cost savings [Ref. 50]). It is still early in the electronic payments implementation process to try to quantify any indirect cost savings. Since most of the Electronic Commerce EDI projects are still in their infancy, it is also difficult to determine actual savings for these projects. By contrast, the consolidation of DoD contract payment functions (under DMRD 910) is already achieving cost savings because DoD budgets have been reduced to reflect the projected savings that consolidation should achieve.

For the contractor, the objective of receiving prompt, accurate data from electronic payments has not been fulfilled. For most contractors the electronic payment process has not simplified invoice payment reconciliation. Part of the problem can be attributed to insufficient bank support for the contractor's electronic payment needs, as described above. Likewise, the objective of receiving payments on time depends upon invoice processing improvements at DFAS-Columbus Center, not electronic payment capabilities. In a sense, electronic payment capabilities are only as good as the processes that support it. Without an adequate invoice processing system, payments will still be

paid late. Without adequate information flow between contractor and bank, invoice reconciliation will remain a problem.

C. SUMMARY OF PAYMENT/ACCOUNTING CYCLE ISSUES.

As stated throughout this study, the electronic payment process is just one small step in the overall pay/accounting process. Problems can occur that delay invoice processing, as well as problems which occur after payment is made. In this section the key payment/accounting cycle issues described in Chapter IV will be summarized.

1. Problems occurring before invoice payments are made.

Timeliness of payments is a major issue with Defense contractors. As stated in Chapter IV, there are systemic problems that add to the delay of processing invoices for payment. Slow document distribution (e.g., contracts and contract modifications) creates a significant delay for DFAS-Columbus Center in the payment of invoices. Without proper documentation to support an invoice, the invoice must wait. Likewise, the need for contract clarifications, especially with contract modifications, creates delays in the process.

Perhaps the most important factor in ensuring that an invoice is paid on a timely basis is the integrity of data entry into the accounting and payment systems. As discussed earlier, DFAS' MOCAS system requires a strict data format for the system to accept information. MOCAS will not, however, prevent erroneous data from being entered. As such, errors may not be caught before a payment is made and must be reconciled later in the process.

2. Problems after invoice payment.

Reconciliation of an invoice payment to its proper appropriation is perhaps the biggest problem faced after a contract payment has been made. There are difficulties associated with the payment/accounting process even when a payment is correct (e.g., matching accounts across different accounting and payment systems, schedule deadlines, etc.). When the pay/accounting process generates a payment that is incorrect (either due to improper payment amount or the wrong appropriation being charged), the correction process can be a very labor intensive and time consuming effort (such as the undistributed disbursement reconciliation discussed in Chapter II).

3. Information Requirements.

The systemic problems that can occur both before and after payment can create delays for both the contractor and DoD activities alike. In a perfect world, all payments would be processed on time, for the correct amount, charging the correct appropriation. Because mistakes happen, the contractor and DoD activities often must involve themselves in the process. As a result, there is an increased need for payment information so that corrections can be made by DoD activities. Contractors likewise need information to determine the status of their invoices.

Based upon interviews and observations during this study, there is a lot of valuable payment information available through DFAS-Columbus Center that is not getting out to the contractors and DoD activities that need it. Much of the problem is due to a lack of knowledge about

what information is available and how to access and distribute it. Chapter VI will provide some suggestions for improved information flow.

One suggestion that is indirectly related to improving the information flow to contractors involves the Defense Logistics Agency's Productivity Enhancement Training (PET) program for small businesses (discussed in Chapter II). A suggested avenue for expanding PET training sessions is through use of DoD's Procurement Technical Assistance (PTA) program. The PTA program is composed of approximately 100 non-profit, small business assistance centers throughout the U.S., whose role is to assist small businesses in contracting with the Federal Government. These centers could provide a valuable network for conducting PET seminars for small business contractors throughout the U.S.

D. AN OVERALL ASSESSMENT OF DoD ELECTRONIC PAYMENTS.

Electronic payments in DoD comprises only a small segment of the overall payment/accounting process. When evaluated on their own merits, electronic payments can achieve cost savings over paper check payments, provide a secure means of payment, and speed up the flow of payment information to defense contractors.

When evaluating the overall payment/accounting process of which electronic payment is just one part, one sees only a marginal improvement to the process at best. Defense contractors value timely payments and accurate data. Electronic payments can provide neither if there are errors in the payment/accounting system or the contractor has

not established a proper relationship with its bank to obtain payment data. Electronic payments have not changed the overall invoice payment process, and as such many of the systemic problems still exist.

As EDI applications are phased in and manual data entry is phased out, payment/accounting system integrity will improve, and errors will be reduced. In the interim, electronic payments may yield only moderate cost savings.

VI. CONCLUSIONS

A. SUMMARY OF THESIS STUDY.

Since the inception of electronic payments in the early 1970's, there has been a steady expansion of electronic payment functions into all facets of consumer and business transactions, including DoD contract payments. The process has been well established through both the Automated Clearing House applications and financial EDI applications. Almost any organization can be linked in some fashion with electronic payment functions through equipment as simple as a personal computer, software, and a modem. Electronic payments can save an organization money (if the volume of transactions justifies the investment in electronic payment capabilities), provide a secure means of sending and receiving payments, and speed up the flow of payment information for both the payer and the recipient.

Within DoD, electronic payment capabilities for contract payments are expanding rapidly, but not without difficulty. Most of the serious issues associated with the implementation of electronic payments do not involve the electronic payment process itself. Rather, they involve the processes before and after the electronic payment transmission occurs. Before an electronic payment can be made, the invoice must be processed within one of many DoD payment/accounting systems. As Chapters IV and V pointed out, problems can occur that can either delay invoice payment, such as document distribution delays, lack of available funding, or

incomplete contract modifications. Other problems can generate an erroneous payment, such as poor data entry or a lack of buying office input into the payment process. As a result of these "systemic" problems, the full benefit of electronic payment capabilities is diminished. An electronic payment is no better than a check payment if it is late or in error.

When a DoD electronic payment is made, payment and remittance data flow electronically from DoD to the recipient bank. It is incumbent upon the bank and the contractor to work out in advance how that information will get to the contractor. Problems have occurred when the banks' electronic payment capabilities do not adequately support the contractors' needs. In some cases there is little, if any, electronic payment information flow from the bank to the contractor. This eliminates a major advantage of electronic payments, that of timely payment information flow.

For electronic payment capabilities to achieve their full potential, the banking industry must integrate electronic payment and Financial EDI capabilities into their services. This will permit the banks and contractors to achieve the payment information flow necessary for electronic payments to be beneficial. For many banks, there is little incentive to do this, since private industry is not aggressively demanding improved electronic payment services. The return on investment for electronic payment service improvements has not been high enough to merit investing in electronic payment services for many banks.

With or without electronic payment capabilities, the overall process by which an invoice is paid within DoD has not changed. Although the designation of paying activities has changed under DMRD 910, an invoice is still processed in the same manner, whether paid by check or electronically. The invoice payment process appears to take on a "pay now, fix it later" approach. The process is clearly reactive (e.g., check for errors after payment is made) rather than proactive (e.g., make corrections before payment). Until the entire invoice payment/accounting process is redesigned, electronic payments will represent only a minor technological advance that achieves moderate cost savings (approximtely $3 per transaction by DFAS-Columbus Center estimates). It will not provide a significant improvement in the overall invoice payment/accounting cycle process. As EDI takes root with the implementation of DoD's Electronic Commerce program, entire business transaction cycles can be improved dramatically. Electronic payments can represent an important achievement in the overall Electronic Commerce program if these systemic problems can be resolved.

B. ANSWERS TO RESEARCH QUESTIONS.

1. Primary Research Question: As one element of the DoD Electronic Commerce Program, how will the expanded use of Electronic Payments improve contract payment capabilities?

Electronic payments will represent only a moderate improvement in DoD's contract payment capabilities for two important reasons. First, DoD's invoice payment/accounting process creates impediments to timely invoice processing. Delays in document distribution, erroneous or

incomplete contract payment information, data entry errors, and a lack of direct input from the DoD buying offices before payment can delay invoice payments or create erroneous ones. Second, banks and contractors may not have a well established electronic payment link. This restricts or stops invoice payment information from reaching the contractor, thus diminishing one of the benefits of electronic payments, timely payment information

Electronic payments may achieve some savings in terms of cost (approximately $3 per payment transaction by DFAS-Columbus Center estimates) and efficiency (by providing a more automated alternative to the check mailing process). However, until these systemic impediments are eliminated, DoD will not achieve the full benefit of electronic payment capabilities.

2. Subsidiary Research Questions.

a. What are the principal elements of Electronic Payments?

As stated in Chapter II, Electronic Payments is comprised of both Electronic Funds Transfer (EFT) and Financial EDI capabilities. EFT deals primarily with the bank-to-bank transfer of value through electronic means, whereas Financial EDI encompasses EFT and the transmission of data between banking and non-banking entities. There is an enormous banking infrastructure, established and monitored by the Federal Reserve System, that permits the electronic flow of payments and payment information. Electronic payments use standardized data formatting and permit a secure and rapid means of transmitting payments and payment information.

b. What Federal Government, DoD specific, or industry standards have been established for Electronic Payments?

There is no single standard for electronic payments. This study closely examined the Automated Clearing House (ACH) network, which is the system used for DoD contract payments. The National Automated Clearing House Association (NACHA) sets the standards for the ACH electronic payment system. There are specific Federal guidelines promulgated under the Department of the Treasury's Green Book, and standards established by the American National Standards Institute (ANSI) X.12 Subcommitee for EDI and Financial EDI transactions. There are Government regulations (such as the Uniform Commercial Code (UCC) and the Code of Federal Regulations (CFR)) that provide guidance for payments in general. For Government contract payments, the Federal Acquisition Regulation (FAR) authorizes the use of electronic payments but does not address the process in any great detail. The DoD Implementation Guidelines for Electronic Data Interchange also support DoD participation in electronic payments through the U.S. Treasury's Vendor Express program.

c. What is the relationship between EFT and EDI, and do the two processes complement each other?

EFT and EDI are closely related but serve two different functions. EFT involves bank-to-bank transactions involving the transfer of value, whereas EDI involves the transfer of data between organizations. There is a spinoff of EDI, referred to as Financial EDI, which involves the transfer of payment information between bank and a non-banking entity. EFT, EDI, and Financial EDI capabilities tend to

overlap each other in payment-related transactions; therefore, they do tend to complement each other.

d. What are the current EDI/EFT contract payment initiatives underway, and to what extent are they achieving their intended result?

In Chapter II, three contract payment systems were discussed, DFAS-Columbus Center (MOCAS); Aviation Supply Office, Philadelphia (IDA); and the Navy's STARS/SEPS project. Each system is electronic-payment capable. Both DFAS and ASO developed their electronic payment applications in-house, whereas the STARS/SEPS project is largely a contractor developed system (EDI Integration Corporation (EIC)). Each of these systems is structured so that EDI applications may be integrated into the payment process. While the DFAS and STARS/SEPS projects are still in the implementation process, some cost savings have been acheived. The electronic payment process at ASO Philadelphia is being phased out as a result of the consolidation of payment functions under DFAS brought about by the DMRD 910. While the electronic payment process within each system has been implemented successfully, the problems associated with invoice processing and payment (as cited earlier) are hindering electronic payment capabilities.

e. What are the current problems/hurdles which must be overcome to achieve EDI/EFT program objectives?

Chapters IV and V discuss the problems associated with DoD electronic payments. The most significant problems involve the processing of invoices before payment and the distribution of payment data after payment. Current DoD payment/accounting systems are prone to

errors which can delay a payment or create an erroneous payment. Payment information sent electronically by the payment office (most notably DFAS-Columbus Center) to the bank may or may not be received by the contractor, depending on the bank-contractor relationship. The electronic payment process in itself is relatively straightforward. However, it comprises only a small segment in the DoD payment/accounting and the contractor payment reconcilation processes.

f. What is Industry's general perspective with regard to Electronic Payments?

An Electronic Funds Transfer survey was sent to 500 DFAS-Columbus Center contractors to obtain the contractors' perspective on electronic payment capabilities, as well as evaluating electronic payment support from DFAS-Columbus Center and their banks. There were 151 respondents who presented a mixed evaluation of electronic payment capabilities. Significant results of the survey included the observation that most contractors (62 percent) found it more difficult to match remittance (invoice) data with the payment notice from their bank after implementing electronic payments. In response to questions about DFAS-Columbus Center service, two-thirds of respondents found DFAS responsive to their needs, although many were frustrated with delinquent or problematic invoices which had not been paid. In response to bank support questions it was observed that most respondents had only a limited knowledge of their banks' electronic payment capabilities.

g. How might EDI/EFT capabilities best be used at field activities, such as Aviation Supply Office, Philadelphia?

Aviation Supply Office, Philadelphia has been at the forefront of EDI implementation for the Navy. ASO has developed many EDI applications in house, and is the leading site for DLA's "EDI Hub" concept, which will link DoD activities into an EDI network. EDI is well ingrained in the business strategy at ASO Philadelphia; therefore, EDI opportunities are being taken advantage of wherever and whenever possible. Because of the consolidation of payment functions under DFAS, brought about as a result of the DMRD 910, ASO Philadelphia has effectively gotten out of the electronic payments business. As a result, ASO's needs have shifted from being a service provider (a DoD payment office) to being a service recipient (a customer of DFAS). With both ASO and DFAS working out this new relationship, it is critical for both to have an understanding of each other's mission, specific mission requirements, and to improve the flow of information to meet those requirements.

C. RECOMMENDATIONS.

There are several recommendations intended to assist DoD activities with the implementation of electronic payment or EDI applications. These recommendations are provided below and listed for the organizations that could implement them.

1. Defense Logistics Agency - EDI Executive Agent.

- Utilize the DLA Procurement Technical Assistance (PTA) program's small business assistance centers as sites for its Productivity Enhancement Training (PET) EDI training program. There are approximately 100 PTA centers that can provide a valuable network for EDI training throughout the U.S. for small businesses.

2. DFAS-Columbus Center.

- The invoice payment/accounting cycle needs to undergo a business process redesign. Many of the "systemic" problems that can impede invoice payments should be carefully examined, identify their root causes, and correct the process. Redesign will require the cooperation of other DoD activities that have a stake in the invoice payment/accounting cycle.

- Examine the American Bar Association's Model Electronic Payments Trading Partner Agreement for possible incorporation into DFAS's electronic payment agreement. The ABA model is specifically designed for electronic payments and addresses issues that may need to be covered under DoD trading partner agreements.

- Examine the possibility of applying the STARS/SEPS electronic payment module to the MOCAS payment system. In the event that the STARS and MOCAS payment/accounting systems are consolidated, the electronic payment modules for both systems should be compared to determine which electronic payment system can best meet DoD's future requirements.

- Re-examine the 23-day invoice payment cycle. With the advent of electronic payments, it may be advantageous to extend the payment cycle for electronic payments.

- Utilize the FEDWIRE communication link between the Federal Reserve Bank-Cleveland and DFAS to transmit EFT reject notices. This will shorten the lag time between bank payment rejection and notification to DFAS that a problem exists.

- Examine the impact the Automated Clearing House's "all electronic ACH" may have on electronic payment deadlines at the Federal Reserve Bank. The all-electronic ACH takes effect 1 July 1993 and may impact courier deliveries of late payment transactions.

- Accelerate the Contract Payment Notice (CPN) - Direct Reporting project between DFAS-Columbus Center and the U.S. Air Force. The CPN process will provide a DoD buying office with a "check" on a contract payment before it is distributed by DFAS. By validating the payment ahead of time, erroneous payments may be stopped before they occur.

- Expand the use of "Trusted Agents". A trusted agent can enter the MOCAS system and make non-financial corrections or adjustments. This may relieve DFAS of correcting simple mistakes in contracting records and resolve minor issues before they become major ones.

- Fully promote DFAS-Columbus Center's Contractor Inquiry System (COINS). The COINS system appears to be widely accepted by DFAS contractors as an invoice tracking aide, and is relatively inexpensive for contractors to implement (personal computer, modem, and software). From a customer service perspective DFAS should consider increasing the amount of information available on COINS, to include additional remittance data. While this may defeat one of the objectives of electronic payments (i.e., to send all payment and remittance data electronically to the contractors' bank), it can improve customer relationships.

- Improve DFAS-Columbus Center's toll-free 800 number service. Survey responses indicated that DFAS does not adequately follow up with contractors on payment issues.

- Defense contractors need to understand clearly that it is their responsibility to obtain remittance data from their bank. This point is stressed by the DFAS-Columbus Center Electronic Payments office. A suggestion may be to emphasize the point in the electronic payment agreement between DFAS and the contractor (If this approach does not work, expanding the role of the COINS system may be the only alternative).

3. Aviation Supply Office, Philadelphia.

- Expand MOCAS data query training. The MOCAS system has valuable information that the users can extract from MOCAS if they know how to access its many data query menus. Although MOCAS may not generate reports in a format designed for ASO, it is a valuable resource that should be utilized.

- Make it a practice to contact the Contract Management Liason Office (CMLO) at DFAS-Columbus Center in the event of a payment or MOCAS problem the contracting activity cannot resolve. The CMLO can provide valuable assistance to DoD contracting activities on payment issues.

- Examine ASO's document distribution process, especially for contract modifications. Delays in receipt of contracts and contract modifications at DFAS adds unnecessary days to the invoice payment process.

- Re-examine standardization of contract modifications. Where possible, contract modifications should be standardized to permit easier data entry into MOCAS and reduce the number of contract clarification requests issued by DFAS.

D. AREAS FOR FUTURE RESEARCH.

The following are suggested topics for further research in the EDI/electronic payments area:

- Develop a model electronic payments agreement, incorporating elements of the American Bar Associations Model Electronic Payment Agreement with current DoD electronic payment models.

- Compare the costs and benefits of contracting out for EDI and/or electronic payment capabilities with developing those same capabilities in-house. For example, a comparision between the STARS/SEPS electronic payment module (contracted out) with DFAS-Columbus Center's in-house electronic payment process to determine which is the more effective approach.

- Evaluate the regulatory and systemic hurdles which prevent DoD payment activities from using commercial banks for electronic payment services. At present DoD is required to use the U.S. Treasury's Vendor Express program for electronic payments. Are there commercial banks which can offer the same services at lower cost?

- Examine the factors leading to undistributed disbursements within DoD. Undistributed disbursements are the result of payments not matching properly with appropriation data. Undistributed disbursements can create serious accounting errors and require a very labor intensive effort to correct.

- Conduct a survey of DLA's Procurement Technical Assistance (PTA) small business support centers to solicit suggestions on how best to approach small businesses with DoD's Electronic Commerce program. The PTA centers are on the "front lines" with small businesses, and can offer valuable information of small business capabilities and interest in EDI applications.

APPENDIX A

LISTING OF ABBREVIATIONS

AAA:	Authorization Accounting Activity
ABA:	American Bar Association
ACH:	Automated Clearing House
AMIS:	Acquisition Management Information System (U.S. Air Force)
ANSI:	American National Standards Institute
ANSI 568:	Contract Payment Management Report (EDI format)
ANSI 810:	Invoice (EDI format)
ANSI 811:	Consolidated Service Invoice/Statement (EDI format)
ANSI 820:	Payment Order/Remittance Advice (EDI format)
ANSI 821:	Financial Information Reporting (EDI format)
ANSI 822:	Customer Account Analysis (EDI format)
ANSI 823:	Lockbox Information (EDI format)
ANSI 824:	Application Advice (EDI format)
ANSI 850:	Purchase Order (EDI format)
ANSI 856:	Shipment Notice/Manifest (EDI format)
ANSI 997:	Application Acknowledgement (EDI format)
ASC:	Accredited Standards Committee (part of ANSI)
ASO:	Aviation Supply Office, Philadelphia (U.S. Navy)
ATM:	Automated Teller Machine

CACHA:	Calwestern Automated Clearing House Association
CAGE:	Commercial and Government Entity
CAS:	Contract Administrative Services, DFAS-Columbus Center
CCD+	Cash, Concentration, and Disbursement (EFT format)
CERPS:	Centralized Expenditure/Reimbursement Processing System (U.S. Navy)
CFR:	Code of Federal Regulations
CHIPS:	Clearing House Interbank Payments System
CLIN:	Contract Line Item
CMET:	Centralized Master Edit Table (U.S. Navy Accounting Function)
CMLO:	Contract Management Liason Office, DFAS-Columbus Center
COINS:	Contractor Inquiry System, DFAS-Columbus Center
CPN:	Contract Payment Notice
CTP:	Corporate Trade Payment (EFT format)
CTX:	Corporate Trade Exchange (EFT format)
DAASO:	Defense Automated Address System Office (Dayton, Ohio)
DCAA:	Defense Contract Audit Agency
DCMC:	Defense Contract Management Command
DFARS:	DoD Federal Acquisition Regulation Supplement
DFAS:	Defense Finance and Accounting Service
DFI:	Depository Financial Institution (EFT terminology)
DITSO:	Defense Information Technology Services Organization, Columbus, Ohio

DLA:	Defense Logistics Agency, Cameron Station, Virginia
DMRD:	Defense Management Review Decision
DoD:	Department of Defense
DSS:	Digital Signal Standard (data encryption format)
EBB:	Electronic Bulletin Board, DFAS-Columbus Center
EC:	Electronic Commerce (DoD EDI implementation program)
EDI:	Electronic Data Interchange
EDIFACT:	Electronic Data Interchange For Administration, Commerce and Transportation (International EDI standard)
EFT:	Electronic Funds Transfer
EIC:	EDI Integration Corporation (contractor for SEPS program)
FAR:	Federal Acquisition Regulations
FEDWIRE:	Federal Reserve Bank electronic payment system
Financial EDI:	Electronic Data Interchange applications associated with electronic payments
FMS:	Financial Management Service (U.S. Treasury)
FMS:	Foreign Military Sales
FMSO:	Fleet Material Support Office, Mechanicsburg, Pa
FOB:	Free-on-Board
FRS:	Federal Reserve System
FRS:	Financial Reporting System (U.S. Navy)
GATEC:	Government Acquisition Through Electronic Commerce (U.S. Air Force)

G06:	Disbursement program within ASO Philadelphia's Integrated Disbursing and Accounting System (IDA)
ICP:	Inventory Control Point (e.g., ASO Philadelphia)
IDA:	Integrated Disbursing and Accounting System (ASO Philadelphia)
IGP:	Intelligent Gateway Processor
ITIMP:	Integrated Technical Item Management and Procurement System (ASO Philadelphia)
MICR:	Magnetic Ink Character Recognition (banking terminology)
MILSCAP:	Military Standard Contract Administrative Procedures
MIT:	Material in Transit
MOCAS:	Mechanization of Contract Administrative Services (DFAS computer system)
MTE:	Machine Transfer Entries (aka., Automated Teller Machine transactions)
NACHA:	North American Automated Clearing House Association
NAVSUP:	Naval Supply Systems Command
NIST:	National Institute of Standards and Technology (U.S. Department of Commerce)
NSN:	National Stock Number
ODFI:	Originating Depository Financial Institution (EFT terminology)
OSF:	Obligation Status File (ASO Philadelphia IDA system)
PET:	Productivity Enhancement Training (DLA EDI Executive Agent)
PMO:	Program Management Office

PTA:	Procurement Technical Assistance (DLA small business support program)
PX:	ASO Philadelphia's new financial accounting system
QAR:	Quality Assurance Representative
RDFI:	Receiving Depository Financial Institution (EFT terminology)
SAMMS:	Standard Automated Material Management System (DFAS-Columbus Center)
SEPS:	STARS Electronic Processing System (STARS electronic payment module)
STARS:	Standard Accounting and Reporting System (U.S. Navy)
SUBCLIN:	Contract Line Item (CLIN) destination
SWIFT:	Society for Worldwide Interbank Financial Communications
TPA:	Trading Partner Agreement
UCC:	Uniform Commercial Code
UOC:	Uniform Operating Circular
VAB:	Value Added Bank
VAN:	Value Added Network
VISANET:	Privately owned and operated Automated Clearing House Network
X12:	American National Standards Institute Subcommittee for Electronic Data Interchange

APPENDIX B

LISTING OF AUTOMATED CLEARING HOUSE ASSOCIATIONS

1. Privately Owned and Operated ACH's.

(Note: "**" indicates ACH Data processing sites; other ACH's utilize the Federal Reserve ACH systems)

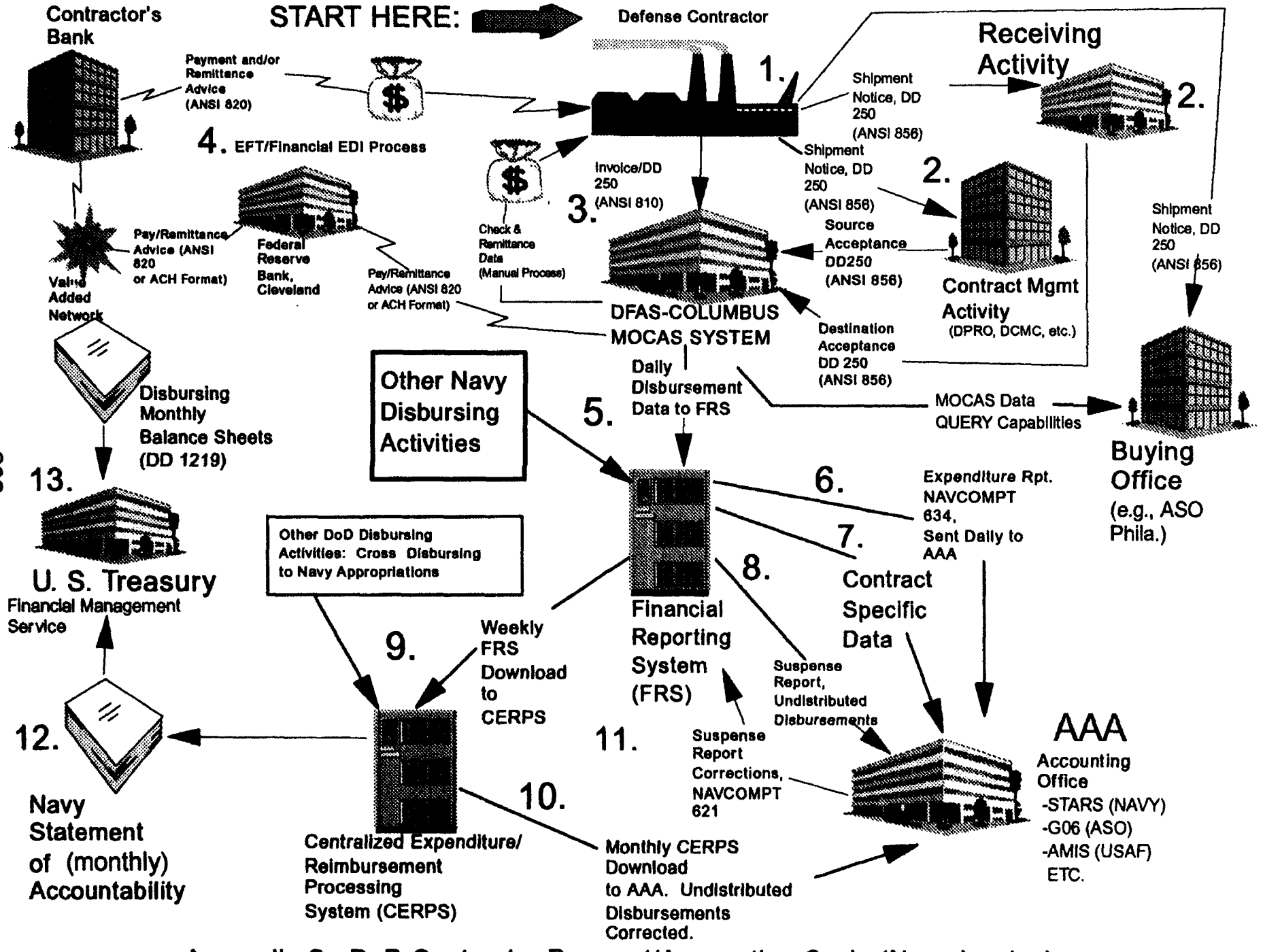
Chase ACH, Inc.	Chemical ACH Association	CitiACH, Inc.
CoreStates ACH Association	Electronic Payments Exchange (Bank of America)	First Chicago ACH
First Interstate ACH Association	Harris ACH Association	Mellon ACH Association
VISA U.S.A.**	Wachovia ACH Association	Payment System Network (formerly Florida Payment Systems, Inc.)

2. Federal Reserve Operated Regional ACH's.

Alabama ACH Association	Arizona Clearing House Association**	CalWestern ACH Association (CACHA)
Central Regional Automated Funds Transfer System	Georgia ACH Association	Indiana Exchange, Inc.
Iowa ACH Association	Kentuckiana ACH Association	Michigan ACH Association
MidAmerica Automated Payments System	Mid-America Payment Exchange (2 locations)	Mid-Atlantic Clearing House Association
Midwest ACH Association	New England ACH Association	New York Automated Clearing House**
North Carolina ACH Association	Northwest Clearing House Association	Oregon ACH Association

Rocky Mountain ACH Association	South Carolina ACH Association	Southern Financial Exchange
SouthWestern ACH Association	Tennessee ACH Association	Third District Funds Transfer Association
Tri-State ACH Association	Upper Midwest ACH Association	Virginias ACH Association
Wisconsin ACH Association		

[Ref. 9]



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Appendix C: DoD Contractor Payment/Accounting Cycle (Navy Invoice)

APPENDIX C

DoD CONTRACTOR PAYMENT/ACCOUNTING CYCLE (NAVY INVOICE) SEQUENCE OF EVENTS

STEP 1: Contractor mails invoice (transmits electronically if an EDI transmission (ANSI 810) to DFAS-Columbus Center for processing and payment. Shipment notices (usually DD-250's if manual, ANSI 856 if EDI) are sent to the Receiving Activity, the cognizant Contract Managment Activity, and an information copy to the Buying Activity.

STEP 2: Material is accepted by the Receiving Activity if it is an FOB (free on board) destination shipment. Material is accepted by the Administrative Contracting Officer (ACO) or Quality Assurance Representative (QAR) at the contractor's plant if it is an FOB source shipment. In either case, receipt acceptance is sent to DFAS-Columbus Center.

STEP 3: Once the invoice is received, DFAS-Columbus Center enters invoice, contract number, and other pertinent data onto MOCAS. If the invoice is received via EDI, the data is automatically entered into MOCAS. The automatic "Prompt Payment" clock starts once the source or destination acceptance is received. Erroneous invoices are returned to the contractor.

On day 23 of the Prompt Payment cycle, the payment "package" (invoice, contract information, remittance data or EFT authorization) is sent to DFAS Cash Management for payment by check or Electronic payment that day.

STEP 4: Day 23. The payment process is initiated. If by check, the check and remittance data are sent directly by mail to the vendor. If electronically, an electronic pay instruction with remittance data is sent via the Federal Reserve Bank (Cleveland) ACH network. The Navy's account at the Federal Reserve Bank is debited by the payment amount. The payment instruction is sent via the ACH network, usually through a Value Added Network (VAN) service, to the Contractor's bank. The electronic payment application (i.e., ANSI 820, CCD+, CTX, CTP) is predetermined by arrangement with DFAS-Columbus Center and the Contractor's bank. The Contractor is responsible for obtaining the remittance data from their bank.

STEP 5: This step begins the link between disbursement and accounting systems. All accounting/disbursement information from DFAS-Columbus Center is transmitted to the Navy's Financial Reporting System (FRS) daily. Other Navy disbursing activities (referred to as Financial Information Processing Centers, or FIPC's) likewise transmit their disbursing data each day. The FRS consolidates the data, updating the "unofficial" cash book balance for the Navy.

STEP 6: A listing of detailed expenditure (NAVCOMPT 634 Report) is sent directly to the Authorized Accounting Activity (AAA) on a daily basis. This report provides the AAA with the first detailed accounting information on payments made from DFAS-Columbus (or other Paying Offices).

STEP 7: In addition to disbursing data, detailed contract information (data down to the individual contract level) is entered into the AAA's accounting system. The accounting system used depends upon the funding source that has been designated in the contract. For this example, the Standard Accounting and Reporting System (STARS) will be used.

STEP 8: The FRS system performs several critical functions, One of which is to make corrections to the accounting data at the appropriation and subhead level, so that disbursements can be reported up to the Navy's "official" financial reporting system, the Centralized Expenditure/Reimbursement Processing System (CERPS). To make these corrections, an edit function, referred to as Centralized Master Edit Table (CMET), checks for improper accounting data (i.e., appropriation, subhead, AAA, etc.). At present this process occurs after payment has been made. Corrections to appropriation/subhead data are made by the FRS personnel so that the "official" disbursements may be reported to CERPS. All other appropriation line errors are classified as "unofficial", since they are not reported to CERPS. It is the responsibility of the AAA's to make any corrections necessary to match the CERPS "official" total. Erroneous (unofficial) accounting information that cannot be corrected by FRS personnel may be submitted to the AAA (STARS) for correction. This report is referred to as the Undistributed Disbursement Suspense Report. This is one of many "suspense" type reports which can make corrections to appropriation data.

STEP 9: The FRS consolidates the daily disbursing reports into a weekly report. It matches the daily totals to the weekly total. If correct, the "official" data (appropriation and subhead level only) is transmitted to CERPS. The CERPS system consolidates all Navy disbursements for reporting to the U.S. Treasury. Non-Navy disbursing activities which are charging Navy appropriations (called "cross disbursing") are entered into CERPS as well.

STEP 10: The weekly FRS disbursement reports and the cross disbursements from other activities are consolidated into an "official" monthly data report. The monthly report is verified with the weekly reports. A data download of the official disbursement report is sent to the AAA. This report updates the AAA's accounting system and generates an "unofficial" undistributed report at the AAA. This report tells the AAA what appropriation data it must correct in order to match the CERPS official record.

STEP 11: The AAA performs a "manual scrub" on the Unofficial Undistributed report, as well as any other Suspense reports generated locally or by the FRS. The NAVCOMPT 621 form is used to make these "double entry" corrections. The 621 forms are consolidated onto the NAVCOMPT 621 Suspense Report Corrections, which is submitted to the FRS for posting. The NAVCOMPT 621 results in corrective debits/credits to Navy appropriations at the unofficial level. This is a continuous process between the AAA and the FRS.

STEP 12: The CERPS system generates the Navy's Statement of Accountability, which is reported monthly to the Treasury.

STEP 13: The U.S. Treasury's Financial Managment Service (FMS) matches the CERPS consolidated statement with the individual monthly disbursing balance sheet reports (DD 1219). The totals should match exactly.

APPENDIX D

SAMPLE INTERVIEW QUESTIONS

The following is a sampling of questions asked during interviews conducted from February 22 - March 2, 1993 during site visits to DFAS-Columbus Center, ASO Philadelphia, DLA Headquarters (Cameron Station, Virginia), DFAS-Cleveland (Washington, D.C. Office), and Naval Supply Systems Command (Washington, D.C.).

A. DFAS-COLUMBUS CENTER (FEBRUARY 22-24, 1993).

1. Glenda Brown, EFT Payments Office.

- Question: Matching remittance data to payments. About 75% of the surveys returned indicate that matching remit data to the EFT payment data is more difficult. Some contractors don't know what they've been paid until their monthly bank statement arrives. *Is this a DFAS problem, a contractor problem, a bank* problem, or all three?

- Question: Trading Partner Agreements. I know about the upcoming changes to the FAR to make EFT the standard, but how much of a hassle is it to renegotiate EFT trade partner agreements for each contract?

- Question: Getting banking industry to convert to Financial EDI vice checks. *From what I've read, the check clearing function* is a "bread and butter" function that the banks will not want to give up. Contractors are not pushing their banks to go electronic. What, from a DFAS perspective, can and is being done to push/pull the banking industry and contractors into EDI?

2. Barbara Forcier, Contract Management Liason Office.

- Question: How is DFAS managing TPA's (Trading Partner Agreements)? Is it just a "file and forget" process, or an "active agreement needing constant attention?

- Question: What is a Trusted Agent?

- Question: What are the data query functions within the MOCAS system?

3. John Sutter, Southern CAS Directorate.

- Question: Based upon some of the survey responses, if an invoice is "trouble free" it flows through the payment process quickly. If there are problems, it seems to fall into an abyss. What percentage of invoices fall into this category, and what is being done to improve on this problem?

- Question: Hard copy retention requirements. FAR 4.7 requires contractors to retain hard copy invoice data. Do "electronic files" fulfill this requirement, or must actual hard copy documents be maintained? Is this an issue with your contractors?

- Question: Receipt of required data from DCMC, DCAA. DCAA interim cost voucher approval, DCMC payment approvals, and receiving activity signatures are all required to pay an invoice. How is your relationship with these activities, and are they providing the necessary documentation to you on time?

4. Mr. Mike Noe, Ms. Pat Chambers, Information Resources.

- Question: Automating manual processes. "Experts" say that for EDI to be truly effective, all manual processes must be removed/reworked. I can see a dilemma here, since DFAS (and all DoD) must offer both manual and automated processing to accomodate its customers. Must existing manual processes remain in place "as is" to supplement EDI transactions, or can/have manual processes undergone "rework" along with EDI expansion?

- Question: User access to MOCAS. With DFAS taking responsibility for payments, the field activities which once had these function must now rely on DFAS and MOCAS. MOCAS (from what I've seen) is not that easy to use. What training is being directed from DFAS on the MOCAS system, and are field activities able to access the MOCAS database and obtain information in a similar format to that which they previously had before DMRD 910?

- Question: Security measures. How does DFAS ensure a secure environment in light of the expanded access to data, especially from non-DoD activities?

5. Ron Koen, Director, Disbursing Office.

- Question: How does DFAS process a daily electronic payment transaction?

- Question: What are EFT rejects, and how do you process them?

- Question: How does the Federal Reserve transaction deadline impact DFAS electronic payment functions?

6. Jeff Grossclose, AMIS/MOCAS integration project.

- Question: Overall AMIS/MOCAS project. What is the current status of the AMIS/MOCAS merger? Current issues, concerns?

- Question: Manual data entry into MOCAS. In discussions with some MOCAS users, I understand that at present the user must manually enter data from AMIS to MOCAS. If so, what steps are being taken to automate data entry?

- Question: Contract payment structure. Specifically looking at the payment function, AMIS pays contractors using a U.S. Treasury vendor control number, while MOCAS pays contractors by contract number. Is this a particular problem in merging the two systems?

B. AVIATION SUPPLY OFFICE, PHILADELPHIA (FEBRUARY 25-26, 1993).

1. Mr. John Fullerton, Disbursing/Payments Division.

- Question: Material in Transit (MIT) issue. Is automating the DD 250 improving the MIT issue? Has the consolidation effort of payments to DFAS exacerbated the problem?

- Question: What volume of payments came out of ASO prior to DMRD 910? How is the transition of ASO as a paying activity to DFAS as the paying activity being made?

- Question: What are the improvements that the new PX system will have over the IDA system.

2. Ms. Sandra Rill, EDI Program Manager.

- Question: What is your greatest concern about DFAS taking over contract payments?

- Question: Overall EDI project at ASO. For each ANSI transaction set you plan to implement, what is the determining factor(s) you look at: cost savings, transaction volume, contractor request, cost of implementation, training costs, or all of the above?

- Question: Implementation of MOCAS/STARS-SEPS. What guidance have you received from DFAS and/or NAVSUP regarding implementation of either/both of these systems?

3. Mr. Dave Orr, Accountant.

- Question: How do you perform undistributed disbursement reconciliations?

- Question: What data query access do you have with MOCAS?

4. Mr. Dave Grayson, Management Analyst.

- Question: How successful do you feel ASO has been at eliminating paper processes at ASO?

- Question: Is it a fair assessment to say that conversion to EDI transaction sets has worked great where applied, however the accounting system has not yet caught up and subsquently old problems still exist?

- Question: What are the qualities of ITIMP? Its limitations?

5. Ms. Kathleen Tonoff, Contracting Officer.

- Question: What are the most significant problems you are experiencing with DFAS-Columbus Center?

- Question: How does ASO track DFAS document requests?

C. DEFENSE LOGISTICS AGENCY EDI EXECUTIVE AGENT (MARCH 1, 1993).

1. LtCol Joe Michels.

- Question: EDI project portfolio. With such a wide variety of EDI projects from all facets of DoD at various stages of development, it would seem that there must be some milestone review process (similar to defense contracting) to determine whether a project is to continue or get cut. Does the Executive Agent establish any criteria for project approval/rejection, or is this the function of the respective services?

- Question: Bridging software. Since many of the existing computer systems were designed as "stovepipe" systems, and the move afoot to consolidate systems, do you foresee the use of bridging computer software to link systems/applications together?

- Question: What is the EDI "Hub" concept?

2. Maj. Harry Steck.

- Question: How is ANSI managing the growth in EDI applications?

- Question: What are the problems being faced in implementing EDI within DoD?

D. NAVAL SUPPLY SYSTEMS COMMAND EDI PROGRAM OFFICE (MARCH 2, 1993).

1. Mr. Richard Brooks, VEDA, Inc. (Contractor).

- Question: What are the current initiatives that the NAVSUP EDI Program Office is working on?

- Question: How does the NAVSUP PMO address the tradeoff between aggressively pursuing EDI projects and cost containment?

- Question: Transaction set limitations. ANSI is expanding beyond its initial format to include industry-specific transaction sets. Since the intent of EDI is to develop a single business transaction used by all, what pressures are being put on ANSI to modify/create new EDI transaction sets for specific DoD requirements? Who drives this, industry or DoD?

E. DFAS-CLEVELAND: STARS/SEPS PROJECT OFFICE (MARCH 2, 1993).

1. Ms. Dottie Collins, SEPS Project Manager.

- Question: How does the STARS system interface with the Navy's Financial Reporting System?

- Question: What is the current status of the SEPS implementation project?

- Question: What are the implementation problems you are running into with service type contractors (i.e., Xerox, AT&T, etc.)?

APPENDIX E
SAMPLE ELECTRONIC PAYMENTS QUESTIONNAIRE

ELECTRONIC FUNDS TRANSFER
DEFENSE CONTRACTOR SURVEY

PART I: ORGANIZATIONAL BACKGROUND (circle/check appropriate answer)

1. Is your organization a DoD designated "Small Business"? Yes No

2. What was your organization's total sales for your fiscal year 1992? $_____

3. What percent of your total sales is to the U.S. Government? (approximate percent) _____%

4. How many receipts/payments does your organization process on average per month? (approximate number of transactions)

   Payments _____ /month
   Receipts _____ /month

5. Which of the following classifications of material/services does your organization provide to the U.S. Government? (check applicable line(s)):

   Major Systems items and/or their components _____
   Spare parts (under $25,000) _____
   Commercial "Off-the-Shelf" items _____
   Repair Services _____
   Consulting Services _____
   Commercial Services (Food Service, Janitorial, etc.) _____
   Other (please describe): _____

   _____

6. Does your organization's Accounts Receivable department currently accept Electronic Funds Transfer (EFT) payments? Yes No

   If yes, proceed to question 7. If not, please answer questions at the top of the following page.

a. If not, why not? (please select from list below):

1. We prefer receiving paper checks. _____
2. Bank fees for EFT services are too high. _____
3. The accounting department would learn of the transaction later than the bank does. _____
4. Lack of proper software to bridge into our in house accounting application software. _____
5. Other (please explain): _____

_____

_____

b. If not, does your organization have plans to implement EFT in your accounts receivables? Yes No

c. How much would your organization be willing to spend for in house EFT receivable application software? (circle dollar amount below)

not interested at any price	under $500	between $500-$1000	between $1000-$1500	over $1500

Please proceed to question 8.

7. For how long has your organization been accepting EFT payments? Less than 1 year / More than 1 year

8. Does your organization's accounts payable department currently issue payments using EFT? Yes No

If yes, proceed to question 9. If not, please answer the questions below:

a. If not, why not? (please select from list below):

1. Payment "float" issue. _____
2. Current software application does not support EFT payments. _____
3. Projected cost to change our in house application for EFT payments is too high. _____
4. We have EFT translation software, but it is not linked to our in house accounting application software. _____
5. We were not aware of the EFT payment option. _____
6. Other (please explain):_____

_____

b. If not, does your organization have plans to implement EFT in your accounts payables? Yes No

c. How much would your organization be willing to spend for EFT payable application software? (please circle dollar amount below):

not interested at any price	under $500	between $500-$1000	between $1000-$1500	over $1500

Please proceed to question 10.

9. For how long has your organization been issuing EFT payments? Less than 1 year / More than 1 year

10. Does your organization receive EFT data in any of the following formats? (please circle the appropriate format(s)):

Corporate Trade Exchange (CTX)	Yes	No
Corporate Trade Payment (CTP)	Yes	No
Cash Concentration and Disbursement (CCD+)	Yes	No
Payment Order/Remittance Advice (ANSI 820 transaction set)	Yes	No

11. How do you receive your remittance (payment) data? (check-appropriate line):

a. Payment and remittance data received from bank. ____
b. Payment data from bank, remittance data from the Defense Finance and Accounting Service (DFAS). ____
c. Payment data only from bank, no remittance data received. ____
d. Payment and remittance data received from DFAS. ____

12. Before EFT, what method of payment did your organization primarily use? (check appropriate line):

a. Check received via mail. ____
b. Check received via lockbox. ____
c. Other (please describe): ____

_____

_____

13. Currently what percent of your total dollar receipts (private industry + Government) do you receive by other than EFT? (approximate %) _____%

14. Of the following benefits typically identified with Electronic Funds Transfer, please rate how important it is to your organization (circle appropriate number)

	Most Important → Least Important				
a. Eliminates lost/stolen checks:	5	4	3	2	1
b. Eliminates the need to physically deposit the check:	5	4	3	2	1
c. Provides a better managerial tool for in house planning of cash flow:	5	4	3	2	1
d. Prompt, accurate flow of payment data:	5	4	3	2	1
e. Ease of reconciliation of payment to your accounts receivable:	5	4	3	2	1
f. Provides for greater security of payment information:	5	4	3	2	1
g. Greater cost savings than paper transactions:	5	4	3	2	1
h. Receipt of payments on time:	5	4	3	2	1

PART II: EVALUATION OF DFAS-COLUMBUS EFT CONTRACT PAYMENTS

15. What percentage of DoD contract payments did you receive late in your fiscal year 1992? (please circle approximate percentage)

None	Less than 10%	Between 10%-25%	Between 25%-50%	Over 50%

16. In general, are your invoices being processed faster using EFT than before? Yes No

17. Do you presently use the DD-250 (Material Inspection and Receiving Report) as an invoice, or do you use your own invoice? (circle one) use own invoice use DD-250

18. Do you find that the number of erroneous payments has been reduced since using EFT? Yes No

19. Is the matching of payments to the remittance data easier with EFT? Yes No

20. a. Has your organization used any of the following services provided by DFAS-Columbus?

1. Electronic Bulletin Board Yes No
2. Toll free 800 Number Yes No
3. Contractor Inquiry System (COINS) Yes No

b. If yes to 20a above, please describe how beneficial the service has been to your organization: _____

_____

_____

_____

c. In general, has DFAS-Columbus been responsive to your payment issues/concerns? Yes No
Any comments you may have regarding DFAS support:

_____

_____

_____

d. What service(s), if any, would you like to see added to improve the EFT contract payments process discussed above? _____

_____

_____

_____

_____

21. a. Does your organization presently process EFT transactions with any agency of DoD other than DFAS-Columbus? Yes No

If Yes, please answer parts b through d. If no, please go to question 22.

b. Which agencies? _____

_____

_____

c. Does having multiple DoD EFT trading partners complicate your pay receipts process? Yes No

d. What would simplify having multiple DoD EFT trading partners?

_____

_____

_____

_____

PART III: BANK SUPPORT FOR ELECTRONIC FUNDS TRANSFER

22. Does your bank presently offer EDI/EFT services? Yes No

If no, please proceed to question 27.

23. Are you familiar with the Electronic Data Interchange (EDI) services that your bank offers? Yes No

If yes, which of the following services does your bank offer? (please circle; question mark (?) = don't know)

a. EFT payment data only	Yes	No	?
b. EFT payment data with limited remittance data (CCD+)	Yes	No	?
c. Corporate Trade Exchange (CTX) format	Yes	No	?
d. Corporate Trade Payment (CTP) format	Yes	No	?
e. Payment Order/Remittance Advice format (ANSI 820)	Yes	No	?
f. Financial Information Reporting (ANSI 821)	Yes	No	?
g. Customer Account Analysis (ANSI 822)	Yes	No	?
h. LockBox Information (ANSI 823)	Yes	No	?
i. Application Advice (reporting acceptance or rejection of an EDI transaction, ANSI 824)	Yes	No	?
j. Functional Acknowledgement (ANSI 997)	Yes	No	?

24. Did the EDI services provided by your present bank influence your decision to use that bank? Yes No

If yes, please explain briefly what services are important to you that the bank offered: _____

_____

25. Is the cost of EDI/EFT services offered from your bank competitive with other banks? Yes No ?

26. Has your organization encountered any problems in obtaining remittance data from your bank? Yes No

27. Do you feel that your bank is responsive to your electronic payments needs? Yes No

28. Does your organization utilize Value Added Network (VAN) services to assist your EDI/ EFT functions? Yes No

29. Of the following security measures associated with EDI/EFT, please rate how important they are to your organization (circle appropriate number):

	Most Important -->				Least Important
a. Electronic signature capability:	5	4	3	2	1
b. Data encryption capability:	5	4	3	2	1
c. Data authentication capability:	5	4	3	2	1
d. Computer user access control:	5	4	3	2	1
e. Receipt acknowledgement of transactions capability:	5	4	3	2	1

30. Please add any additional comments you may have: _____
_____
_____
_____

31. Would you like a summary of this survey's results? Yes No

The following questions are optional:

32. **Your Name:** _____
33. **Your Title:** _____
34. **Name of your Organization:** _____
35. **Telephone No.:** _____

Thank you for taking the time to complete this survey. Your efforts are most appreciated. Data collected will assist in evaluating how DoD is doing in its contract payment processes.

Please use the self-addressed, stamped envelope included with the survey for returning it.

APPENDIX F
DEFENSE CONTRACTOR EFT SURVEY
ADDITIONAL SURVEY RESULTS

This appendix provides data from the defense contractor EFT survey that has not previously been discussed in Chapter IV. Tables and graphs will be presented for several of the remaining questions from the survey. Some additional contractor comments regarding DFAS-Columbus Center will be provided as well. Finally, several of the survey questions were compared to see if there is any correlation in the data. The results of this analysis is provided in this appendix.

1. Survey Question Responses.

a. Accounts Receivable Implementation Cost (Question 6c.).

Contractors currently not using electronic payments were asked how much they were willing to spend to implement electronic payments for accounts receivable. Table 24 provides the responses of 12 of the companies.

TABLE 24.

HOW MUCH WOULD THE CONTRACTOR PAY FOR ELECTRONIC PAYMENT CAPABILITIES WITH THEIR ACCOUNTS RECEIVABLE?

Amount willing to pay	Number of Responses	% of total responses
Not at any price	4	33.3%
Under $500	5	41.7%
From $500-1000	1	8.3%
From $1000-1500	1	8.3%
Over $1500	1	8.3%

b. Duration of EFT for Accounts Receivable at Contractor (Question 7).

Contractors were asked how long they had been processing electronic payments for their accounts receivable. Table 25 provides the results.

TABLE 25.

HOW LONG HAS YOUR ORGANIZATION BEEN ACCEPTING ELECTRONIC PAYMENTS?

Response	Number of Responses	% of Total Responses
Under 1 year	30	22.2%
Over 1 year	104	77.0%
Do not know	1	.7%

c. Cost to Implement EFT for Accounts Payable (Question 8c).

Responses to question 8b indicated that 86 percent of contractors had no plans for implementing electronic payments for accounts payable. Not surprisingly, nearly two-thirds of the 127 respondents indicate that they would not implement electronic payments for accounts payable at any price, as Table 26 displays.

TABLE 26.

HOW MUCH WOULD YOUR ORGANIZATION PAY FOR ELECTRONIC PAYMENT CAPABILITIES FOR YOUR ACCOUNTS PAYABLE?

Amount willing to pay	Number of Responses	% of Total Responses
Not at any price	78	61.4%
Under $500	18	14.2%
From $500-1000	18	14.2%
From $1000-1500	6	4.7%
Over $1500	7	5.5%

d. Volume of Non-EFT Payments for Contractors (Question 13.).

Contractors were asked what percent of their payments were received by other than EFT transmission. Table 27 shows a wide distribution in their responses. What may be derived from this data is that most companies still receive payments using several formats and have not gone 100 percent electronic.

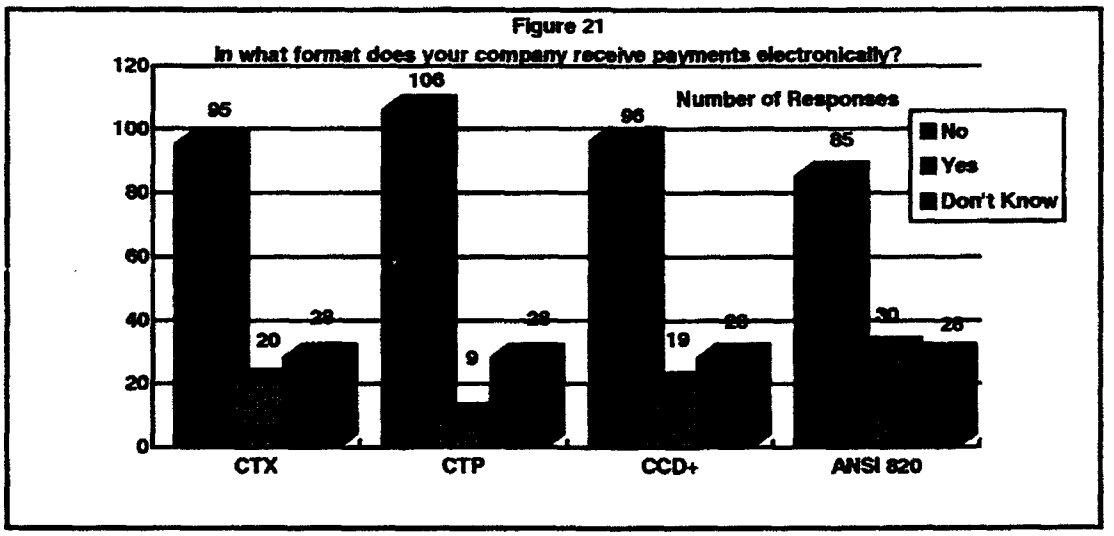
TABLE 27.

WHAT PERCENT OF PAYMENTS ARE RECEIVED BY OTHER THAN ELECTRONIC PAYMENTS?

Percentage Range	Number of Responses	% of Total Responses
0 to 10%	31	22.3%
10 to 20%	9	6.5%
20 to 30%	9	6.5%
30 to 40%	5	3.6%
40 to 50%	15	10.8%
50 to 60%	4	2.9%
60 to 70%	4	2.9%
70 to 80%	12	8.6%
80 to 90%	12	8.6%
90 to 99%	26	18.7%
No electronic payment	12	8.6%

e. Electronic Payment Format (Question 10).

Contractors were asked to identify the electronic payment format they accepted. The formats are Corporate Trade Exchange (CTX), Corporate Trade Payment (CTP), Cash, Concentration and Disbursement (CCD+), and Payment Order/Remittance Advice (ANSI 820). Data results (presented in Figure 21) indicated that most contractors did not know the exact method of transmission.



f. Type of Invoice used by Contractor (Question 17).

Contractors may use their own invoice or utilize the Material Inspection and Receiving Report (DD-250) as an invoice. This question was asked to see how readily accepted the DD 250 is as an invoice. Table 28 provides the results.

TABLE 28.

WHAT TYPE OF INVOICE ARE YOU USING?

Type Invoice	Number of Responses	% of Total
Use own invoice	50	33.8%
Use DD-250	94	63.5%
Don't know	4	2.7%

g. Processing Electronic Payments with Other DoD Activities (Question 21a).

Table 29 reveals that most of the respondents rely upon DFAS-Columbus Center for all their DoD electronic payments. Among the non-DFAS activities, the National Aeronautics and Space Administration (NASA) and Defense Electronics Supply Center (DESC) were cited the most often as electronic payment trading partners. Of the 26 contractors

TABLE 29.

DOES THE RESPONDENT PROCESS ELECTRONIC PAYMENT TRANSACTIONS WITH ANY OTHER DoD AGENCY?

Response	Number of Responses	% of Total Responses
No	116	78.4%
Yes	26	17.6%
Don't Know	6	4.1%

who indicated other DoD electronic trading partners, 92.3 percent (24 out of 26) stated that having multiple DoD trading partners did not complicate their pay receipt processes (Question 21c).

h. Utilization of Value Added Networks (VANs) (Question 28).

Relatively few of the respondents indicated that they utilize Value Added Networks (VANs), as Table 30 reveals.

TABLE 30.

DOES YOUR ORGANIZATION UTILIZE VALUE ADDED NETWORKS (VAN'S)?

Response	Number of Responses	% of Total Responses
No	113	76.9%
Yes	11	7.5%
Don't Know	23	15.6%

2. Additional Comments Regarding DFAS-Columbus Center.

Chapter IV provides a small sampling of commentary provided by the survey respondents. In this section some additional comments will be provided.

a. Question 20b: Evaluation of DFAS-Columbus Center's Customer Services (Electronic Bulletin Board, Toll Free 800 Number, Contractor Inquiry System (COINS)).

- We are continually "on the edge" re our cash balances since we only receive payment on about 4 invoices per month and one late payment can mean missing a payroll.

- (all 3 services used): Tremendous cash flow tracking, inquiry, management capability.

- (800 Number): Usually questions are answered quickly - or you can be put in touch with proper people to handle questions.

- (COINS): COINS is a very valuable and useful system. COINS: able to check on the status of more payments without the aid of the contract rep. - only have to bother DFAS on problem payments.

- (800 Number): Terrible, hard to get through & then get an answer.

- (all 3 services used): Poor, transactions (EFT) may be subsequently voided. System chronically down most of the time. Infrequently updated.

- (800 Number): Allows us to check to make certain vouchers have been entered and are in line for payment. We can catch a problem before it is too late in the month to do any good as far as timely payment.

- (COINS): Extremely useful. People very friendly and helpful.

b. Question 20c: Responsiveness of DFAS-Columbus Center.

- Responsive to concerns but payments are not paid on time. We have numerous unresolved 250's unanswered.

- Our expeditor at Columbus payment office has been extremely knowledgeable & polite.

- Not until approx. 3 weeks ago when one individual accepted the challenge to try and iron out our problems. Much improvement in the past 3 weeks. Prior to that it was almost a "screw you".

- DFAS has been exceptional since its inception. We started receiving payments from them in APR '92. We are very happy.

- No. One person on the 800 number must answer all questions. I have 125 old problems dating back to 1989 - Dup. payment + more.

- Yes, however they still have far too many invoices that disappear + then reappear, late.

c. Question 20d. Contractor Suggestions for Improvements at DFAS-Columbus Center.

- Would like to see DFAS-Columbus mail out remittance data.

- Better indication of payment dates when asked for (sometimes vague).

- Notification that bank transfer has occurred. I don't find out until monthly statements come from the bank.

- Pay more than one invoice per check!

- Automatic contract tie-in to EFT once the company has agreed. Why reconfirm every contract?

- Would like a remittance on payment either from the bank or DFAS, identifying contract no., voucher no., etc. To ensure payments are applied to the correct contract - currently apply based on amount.

- Assign an account manager to each contract to provide a single source of contact.

3. Statistical Analysis of EFT Survey Data.

Some of the survey data was analyzed to see if there was any statistically supportable correlation between questions. A regression analysis was conducted to see if sales volume (question 2) was directly correlated to the volume of receipts and the volume of payments (question 4) from the survey data collected. The results, summarized briefly in chapter IV indicate there is no direct correlation between sales volume and volume of receipts or payments.

Two other analyses were conducted, the first to see if there is a correlation between respondents who were having difficulty matching remittance data (Table 18, chapter IV, survey question 19) and those respondents who are not familiar with their banks electronic payment services (Table 20, chapter IV, survey question 23). In this first comparision it was expected that a those contractors having difficulty matching remittance data would also be unfamiliar with their banks services. Based upon correlation results, only 32 percent (48 out of 150 who answered questions) of those contractors who were having trouble matching remittance data were also unfamiliar with their bank services.

The second analysis attempts to find a correlation between respondents who were not familiar with their banks' electronic payment services (Table 20, chapter IV, survey question 23) and those contractors who felt their banks were unresponsive to their electronic payment needs (Table 22, chapter IV, survey question 27). It was expected that those having difficulty matching remittance data would also be unhappy with their bank. Based upon correlation results, only 14 percent (21 out of 150 who responded) having difficulty with remittance data were also unhappy with their bank's support.

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